# TANNA ISLAND SOUTHERN NEW HEBRIDES

Tanna Island is the second largest of the five sothernmost islands of the New Hebrides group which are locally known as the southern group. It lies approx. between east longitude 169 deg. 12-1/2' and 169 deg. 28' and south latitude 19 deg. 20' and 19 deg. 40', being roughly kidney shaped and approx. 24 miles long NW and SE by 15 miles wide NE and SW at its narrowest, a little north of the centre and 20 miles wide at its widest rhough the southern mts. which contain the highest and most rugged country on the island.

Geologically the island is divided into 2 areas. The southern half being extremely volcanic with one active parasitic cone and a thermal area and the northern half which is coral sea floor volcanically raised, outcrops of coral being common above the 1000' mark and odd outcrops appearing at higher levels. The volcanic area is composed of volcanic ash, volcanic mud, scoria and lava bombs, etc., in places ridges of semi-hard volcanic mud flowes over a lava stone base which outcrops all along the coastline in black rocks. The soil is very loose and prous and subject to much erosion which makes the country very irregular and rugged and everywhere intersected by deep steep side storm channels which with time have become precipitious side valleys. The surface soil is a thin layer of mould and humus which must be very rich as it supports a dense and varied vegetation. In the opposite direction to the prevailing winds and at the foot of the volcano lies a completely bare volcanic ash plain with a fresh water lake in the western half of it, this lake varying in size according to rainfall as its tributary streams drain the greater part of the southern mountain area, it has no outlet, but drains

away though the porous soil under a coastal ridge and appears along the coast line for 4 miles as hot water springs between high and low water or slightly below that level, in places making it impossible to enter the sea (Sulphur Bay). This volcanic ash must contain some plant value as the hardier scrubs, pandamusa and cane grass are constantly encroaching on this plain but the steady fall of fresh ash which when accompanied by rain kills vegetation (sulphuric or nitric acid?) kills it off again. This volcanic ash destroying the vegetation has an important bearing on the bird life of Tannas as with an active volcanic period and rain a strip of vegetation miles wide to the extreme edge of the island may be denuded of leaves and fruit and (thus) compel a semi-migration of the majority of bird life of the area. The mountainous part of this area lying principally in the west and south is very, very rugged and has only 3 possible tracks up into it from the eastern side where it rises almost precipitiously from 200' to over 2000' in places and generally throughout the area has almost sheer faces of 1000' to 2500', precariously held by a low, stunted but dense vegetation, everywhere in the area landslides are common and often dangerous. In the S and SW the mts. fall very steeply to the sea but in the west present a far more gradual slope to the sea. In the north they ran fairly steeply into a high plateau which in turn slopes off gradually into the main backbone of the island.

In the SE the hills rise much more gradually but are nevertheless very steep presenting few practicable routes to the highlands.

All this mountainous area is deeply scored with valleys or chasms, one may be on a semi-flat at 2300 ft. and come to an almost sheer valley gowing down 1000 ft. and only a quarter of a

mile across, this illustrates the ruggedness of the country and the loose nature of the soil which has eroded.

The coral uplift country is entirely different having a clay sub-soil on a rock base and only in odd places does it show the sam erosion effects. In many places the soil is only a shallow layer over rock and consequently carries a light vegetation subject to drought and therefore influencing bird life to a considerable extent.

I have no doubt at one time all the southern portion of the island was a high volcanic peak probably 8-10 thousand ft. as its base then extended across as far as Aniwa. Soundings in the area are scarce but what have been taken show a shelf extending across to Aniwa with numerous sub-marine peaks, no doubt craters and here and there shallow patches, two of which are rapidly making coral and working upwards. No doubt the northern half was a coral shelf which attached itself to the lee side of the island, this volcanic cone and in subsequent volcanic action was raised. At some time the whole top of this cone must have gone gally west (like Karkatoa, Dutch East Indies, the sea probably got in) leaving the bases of the main ash falls to form the western mounts.

Sulphur Bay is a submarine volcanic crater (having no anchorage, I believe soundings near the 300 fathoms mark with precipitious sides). My proofs of this theory are the sub-marine shelf with craters and peaks, the present active parasitic cone has thrown up its peaks to exactly correspond along all sides except the E. with what I call the residual remains of the old cone. Its highest peak in the lee of the prevailing E SE wind corresponding with Mt. Tokos Mirra, its second E lee with Mt. Melon and so on. Nowhere west of the present crater is a hole which could have been a crater, which of course there couldn't have been under thousands of feet of ash yet east of it are any amount.

The western slopes are more gradual as ash reaching its angle of stability would assume but the western slopes are precipitious and now gouged by water action. Numerous streams or storm channels having beheaded and stolen water from what is actually at present the western water shed as would be expected of water action, being more rapid on an open face without vegetation. Difference in vegetation on the 2 slopes (that on the eastern slope being a younger type) and the depth of deciduous soil in the 2 areas that on the western slope being 10 or 15 times the depth on the east which in places is only an inch skin.

The general larger run of birds to other islands of 3000' alt. (and that only for small areas). Tanna's average ht. would only be about 1000' - 1200' at most. If Tanna had once had an average ht. of 4000' or so this would account for the larger ZOSTEROPS. The way certain birds are zoned, e.g., PTILINOPUS TANNENSIS and DUCULA PACIFICA never (except at hurricanes, odd ones) crossing the lip of sheer old crater base. COLUMBA VITIENSIS not penetrating far into the new area. PORPHYRIO penetrating slowly in. Again the nesting of PUFFINUS LHERMINIERI NUGAX at lower levels is non-colonial yet on most of the extreme southern peaks they are colonial, I believe these birds nested up to greater heights but have been forced into colonial nesting, which if so raises an interesting point in the age of this subspecies, a bird which entirely leaves its nesting area for long periods such as this does would be inclined on returning if used to nesting at greater hts. to make the best of a bad job and nest on the highest available point. Permanent birds, of course, would not be affected the same way even if used to re-nesting in the same locality as they do not arrive in flocks in an altered place. I do not know P. LHERMINIERI's nesting habits elsewhere and what

altitude it selects but it nests to my knowledge (or a very similar, I took no measurements) on Merelav or Star Peak in the Banks Islands. Both these islands are steep volcanic cones rising 5000' or so, yet on Erromanga (to take a close instance, I could give others in the north) we have volcanic peaks of well over 3000' and to the best of my knowledge P.LHERMINIERI NUGAX doesn't nest there, nor on Aneiteum with nearly 3000' peaks, yet on Tanna on an unnamed peak of 2400' east of Mt. Melan they are intensely colonia, yet 400 ft. lower, between Melon and they are semi-colonial, but colonial again on top of Mt. Melon.

Geographically Tanna is roughly divided into a main mountain ridge running NW and SE reaching a ht. of 2500' in a peak in the north and 3230' in a peak in the south, these 2 highlands being connected by a ridge of 1000' or more, and on either side of this mountain backbone lies a coastal strip running up to the 1000' mark in varying slopes. Owing to soil and vegetation differences, these 3 main divisions divide themselves up naturally into 5 large divisions, which I have called East Tanna, South Central Mts., Western coastal, North Central and North East coastal, each of which areas I will deal with or describe separately and sub-dividing each as required to cover their bird life and vegetation. As I consider Aniwa as part of Tanna, I am calling it area 6 and including it with Tanna (but at present date whether it will approximate either NE coastal or E Tanna I cannot say as NE Tanna remains to be done).

Rainfall and vegetation I will deal with in each area separately as these vary according to areas.

For convenience I have split the island into the following areas and sub-areas because of soil or vegetation differences each of which will be described in its own section.

AREA I East Tanna

*1 - White Sands Area
*2 - West Sewi Area
*3 - Eastern Foothills Area
4 - Loanvialla Area
*5 - Ianakahi Area
6 - Port Resolution Area
7 - South eastern Foothills Area

AREA II South Central Mountains

*1 - Labei Plateau
2 - Hanging Valley Area
3 - South-eastern Slopes Area
4 - South-western Slopes Area

AREA III West Coastal Area

1 - Black Beach Area
2 - Loanei? Area
3 - North Lenakel
4 - South Lenakel

AREA IV North Central Mountains Area

1 - North Plateau
2 - Central Saddle
3 - Tor Rebor Plateau

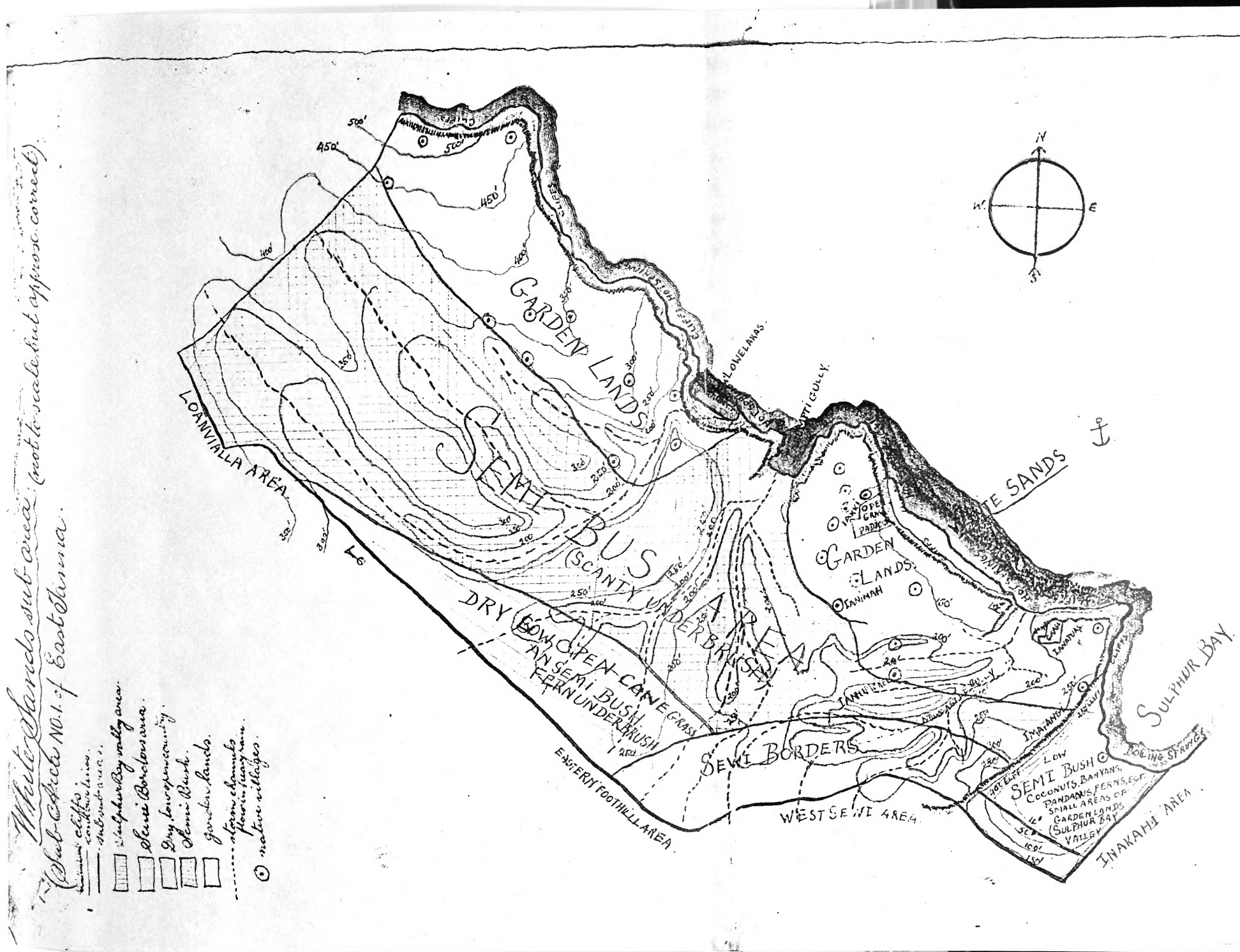
AREA V North-east Coastal

1 - Lonatong Area
2 - Weisisi Area

The following map shows their relative position and detailed maps of each enlarged accompany the rough draft of notes of vegetation and avifauna of each area.

(All areas not done, apparently - D.A.)

*Areas for which a separate report was sent in.




and forms the fresh water lake of Sewi. On the South it is

EAST TANNA SUB SUB AREA 1 WHITE SANDS

This area is roughly 5-6 m. in length by 2 m. wide lying NW and SE with cliffs varying from 500' sheer in the NE to 120' in the SE throughout most of its length these cliffs are principally volcanic tuff, on a lava stone base. The entire area except in the extreme south, where lies Sulphur Bay valley, is a coastal ridge of from 250' in the S rising gradually to 500-600' in the NW. Being composed entirely of volcanic sands and scoria it is much cut up by deep steep sided storm channels which on account of the porous nature of the soil only flow at the heaviest rains. The average annual rainfall must be about 100' fairly evenly spread out, the driest months generally being about August, Sept., Oct., but the only real regularity as regards rainfall is its irregularity.

The area suffers a good deal from drought if rainfall is longer than a month apart as the soil has no clay and rain rapidly soaks away beyond root reach. In spite of this it supports a large native population of over 2000 and has a good bush covering which carries a tremendously heavy bird life of about four species with a number of others well represented. A true census of this area is almost impossible to take as it is really one vast fig orchard which carries crops at various times and causes a tremendous movement amongs the birds.

This area roughly divides itself into 5 main types of country each of which I will deal with in turn starting in the south.

SULPHUR BAY VALLEY - This is a valley about a mile and a half long by half a mile wide starting at sea level and running very gradually up towards it inland end where it rises fairly rapidly into a 15' bank of volcanic sand which crosses the valley and forms the fresh water lake of Sewi. On the South it is

bounded by the foot of the very steep volcanic ridge, rising to 1000' which lies in the northern part of Inakahi area. Along its north side it has a precipitous tuff cliff ranging from 200' - 400' inland which is the end of coastal ridge which runs throughout the White Sands area.

The valley floor is covered with a mixed vegetation. At the coast is a narrow strip of coastal scrub principally brown? Behind this is semi bush of coconuts, banyans, and wild fruit trees. 60 percent of the veg. being coconuts. There are a few small areas of gardenland but not more than 5 percent of the area is so covered. There is some underbrush of ferns and wild cane but very scattered and open except at the head of the valley where the bush dies out into a narrow area of cane grass and pandamus which border on and peter out into the bare ash plain of Sewi.

The valley sides on the N have a low stunted brush or almost bare faces, the south side comes into Inakahi area and is described there. The whole of this area is much affected by the volcanic as coming with rain on a W wind and if rain and an active volcanic period and a west wind come together the whole area is badly burnt and denuded of leaves and vegetation causing the birds to almost wholly migrate elsewhere. I have known the coconuts which are hardy not bear for 3 years after a particular heavy fall and as MYZOMELA feeds much on these in flower one can easily understand why birds in the area have become roamers.

The area normally carries a large number of the 2 species of ZOSTEROPS, they being commonest. MYZOMELA CARDINALIS, LALAGE LEUCOPYGIA, RHIPIDURA FAB. BRENCH. ACRIDOTHERES TRISTIS (imported), and particularly at the inland end HYPOTAENIDIA PHIL. SWIND and at the coastal end MYIAGRA. Not so common in area are CACOMANTIS

PYH. SCH, TRICHOGLOSSUS ORNATUS MASSENA (a traveler) TYTO ALBA LULU, CIRCUS and FALCO PER. visit the area a great deal. TRINGA BREVIPES and PLUVIALIS fairly often along the shore, DEMIGRETTA occasionally appears but not often owing no doubt to the hot or boiling springs making its food scarce. PETROICA very, very occasionally appears. HALCYON, 2 species is very common through the whole valley. CHALCOPHAPS also being common in the coconut scrub parts. PTILOPUS GREYI is fairly numerous at odd times. COLLOCALIA ESCULENTA is quite common especially in certain weather when the whole valley hawking above the trees for the insects. A few HIRUNDO nest in the cliff face but are not very common no doubt due to absence of mud or clay for nests. ERYTHRURA occasionally appear but always traveling through and generally along the cane grass border. Nesting in the area are ZOSTEROPS (two), RHIPIDURA and its parasite CACOMANTIS, MYIAGRA, MYZOMELA, HIRUNDO LALAGE, CHALCOPHAPS, an odd PTILIPUS GREYI, but not common and possibly TYTO. HALCYON nests but not frequently as the trees are unsuitable mostly. COLLOCALIA nest in a few scattered colonies of 4-6 nests at the most in banyan roots and in an inaccessible small cliff, I noticed a colony but it did not appear very strong. ACRIDOTHERES nest in odd banyans, etc., but not commonly. HYPOTAENIDIA nest in the coastal scrub generally at a pandamus foot and in the ferns and cane grass towards the inland end of the valley.

GARDEN LANDS - These areas lie along the coast in two main sections divided by a deep, steep gully, Iakumpti. They are from 130' to five or six hundred ft. above sea level and (have) undulating and irregular slopes. The dense human population has caused an unnatural state of vegetation, few really big trees, unless bread fruit or native fruits and odd banyans being left. As the natives are compelled to practice on an average

only a 3 year rotation as the area is limited by the prevailing wind causing a bad volcanic-affected strip close behind it, the vegetation is principally of a light nature composed of current year gardens which are bare ground or have a rapid growth weed cover. Second year gardens of bananas, sugar cane, paw paws, with a grass (paspalum and cocksfoot, principally) and low weeds, cover and 3rd year garden land of quick growing trees and shrubs venua? and brow? principally, with ferns, Paddie's lucerne (SIDA? RHOMBOFOLIUM) and blue rat-tail and odd clumps of cane grass, with here and there odd patches of 5th and 6th year scrub owned by a large land owner. In amongst all these gardens scattered haphazardly are odd banyans of numerous types of all fig bearers, many types of wild figs, mangoes, breadfruits, rose apples, oranges, mandarines, nut trees of many varieties, fifi plums, and coconuts which form a most plentious and varied diet for fruit eating birds and in their fallen state attract insects, etc. for the insectiverous birds.

Very, very common in the area are the 2 ZOSTEROPS, ACRIDOTHERES TRISTIS and MYZOMELA, all of which nest freely in the area. Very common are 2 types HALCYON which nest fairly freely but more in the borders of the adjoining semi-bush area. CHALCOPHAOS, which nest freely, HYPOTAENIDIA which doesn't nest very much and is very shy and seldom seen. At odd times when certain figs are ripe PTILIPUS GREYI is very common but seldom nests. COLLOCALIA ESCULENTA is common and nest in colonies of 4-6 in scattered banyans. The largest colony I know on Tanna of about 40 is found in one very large banyan in this area. MYIAGRA is present but not in large numbers and nest in the area, as does HIRUNDO in cliff caves, especially lakumpti gully by side and in odd European buildings in the area but it is nowhere common in the area. RHIPIDURA and CACOMANTIS are present but not in any great numbers and odd ones nest but principally

on the borders of the area. ERYTHRURA TRICHROA is present especially in second year gardens where it feeds on the grass seeds and also fig seeds and tassel-shrub seeds, but to the best of my knowledge and from natives, never nests. An odd few MACROPYGIA RUFFA RUFFA (brown phase) occasionally appear and feed on penubre seeds, etc. but are somewhat rare visitors. LALAGE LEUCOPYGIA is fairly common and nests but not to any large extent preferring the bordering semi-brush areas. Along the coast PLUVIALIS appears occasionally in large flocks and TRINGA BREVIPES is fairly common at all times. A few DEMIGRETTA appear but are not very common. Other visitors are CIRCUS, fairly common, FALCO occasionally, TYTO hunts much in the area and perches during day, but prefers the semi-bush areas to roost in. At long intervals an odd COLUMBA VITIENSIS appears and at abnormal times such as after a hurricane an odd DUCULA (once in the last 3 years) or PTILINOPUS TANNENSIS (4 or 5 in four years) may appear. Also at hurricane times FREGATA ARIEL comes over the coast in great numbers. Out to sea odd terns appear and mutton birds may occasionally be seen but all at distances too great for proper identification. TRICHOGLOSSUS ORNATUS is fairly common but does not nest.

SEWI BORDER AREA - This type of country suffers much from volcanic ash rain and is very dry. It is covered for the most part by cane grass and pandamus with a hardy coral fern in places and with a few banyans, principally the small-leaved banyan scattered about here and there with odd patches of stunted brow? scrub and other stunted types of vegetation; except for the banyans, fruit trees are very scarce in the area. It is also subject to almost annual fires set by natives to promote fresh cane growth to supply their garden trellises and fences and house roofs?, etc. Fairly common in the area and nesting freely

are ZOSTEROPS FLAVIFRONS and RHIDIURA FLAV. BRENCH. and its parasite CACOMANTIS. ERYTHRURA TRICHROA is common but does not nest. Also HALCYON JULIA is common and does not nest to any extent. H. TANNENSIS is rarer and does not nest. HYPOTAENIDIA is very common and nests freely but is very shy and seldom seen, though its tracks are everywhere. CHALCOPHAPS is fairly (common) and nests. PTILOPUS GREYI nest a good deal in the area but is not common. MACROPYGIA is occasionally seen passing through but doesn't nest. TYTO is very common, but I don't think it nests in the area. CIRCUS is almost always present hunting in the area and FALCO occasionally appears. COLLOCALIA ESCULENTA is present in numbers but doesn't nest. HIRUNDO hawks about in the area but doesn't nest. MYZOMELA is present and may nest but is not at all common except when the banyan is in certain stages. A very rare COLUMBA VITIENSIS may appear. Very occasionally a very large swift appears hawking over the area, which looks like MICROPUS PACIFICUS of Australia but has not been seen lately. LALAGE LEUCOPYGIA is fairly common and nests freely in the area. ZOSTEROPS LATERALIS is not as common as elsewhere but is common and nests very freely in the area. MYIAGRA is only an occasional visitor and rare. TRICHOGLOSSUS is only an occasional visitor but passes over head a great deal.

DRY LOW OPEN CANEGRASS SEMI-BUSH - This country lies more or less under volcanic rain area and suffers much there from. It carries more trees and scrub than the Sewi borders and less pandamus and the canegrass is more clumpy and open and towards its northern end it carries a good deal of ferny underbrush and a great number of tree ferns. Its bird life is more numerous than Sewi borders as the banyans are more numerous and consequently food more plentiful. The birds are the same as in Sewi except that ZOSTEROPS LATERALIS is more numerous and so is MYIAGRA and HIRUNDO is almost absent. All others increase in numbers to Sewi

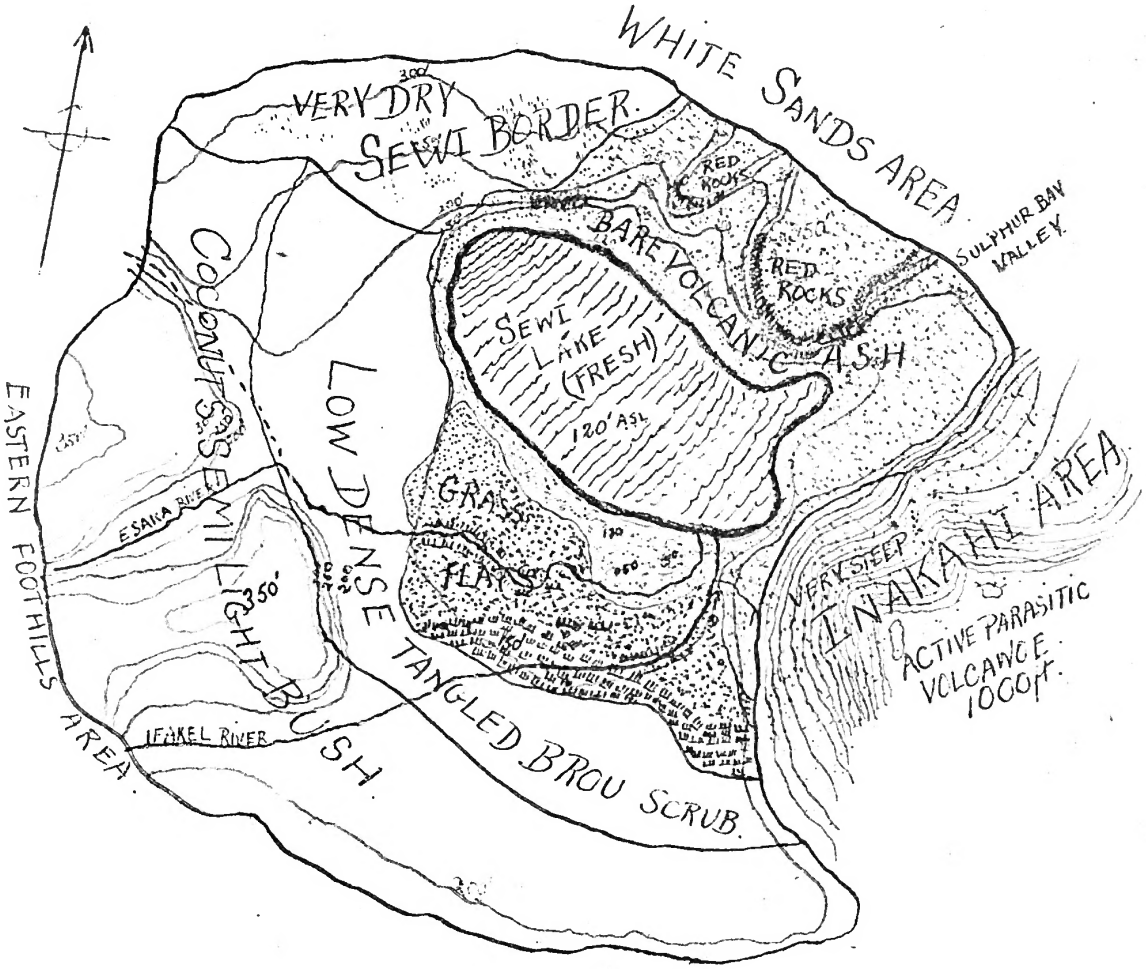
borders area. This area is also subject to fires bi-annually.

SEMI-BUSH AREA - This covers the greater part of the area and is composed of a vegetation of many many banyans and large trees, fiji plums, etc. with a secondary growth under them of smaller trees and shrubs and cane grass clumps, wild kava, ferns and pandamus. The underbrush is now every where dense, the whole area being dry and running a large number of pigs which keep the underbrush down considerably. It is everywhere intersected by steep sided storm channels running in all directions. It is also subject to odd volcanic rains but not to a very large extent. It has many figs and nuts and native fruits and many, many coconuts especially along the storm channels.

In the area both ZOSTEROPS are very common and nest. LALAGE LEUCOPYGIA is exceedingly common and nests, MYIAGRA is very common and nests. MYZOMELA is very, very common and nests. Both HALCYONS are very, very common and nest in limbs and fern tree stumps. ACRIDOTHERES is very common and nests. COLLOCALIA ESCULENTA is fairly common and nests in small colonies in banyans throughout the whole area. A few HIRUNDO hawk but are not common and don't nest. ERYTHRURA TRICHROA is often present in large numbers but varies and does not nest. CHALCOPHAPS is very, very common and nests freely. PTILIPOS GREYI is also fairly common and nests freely. MACROPYGIA visits the area at times fairly frequently but does not nest. An odd COLUMBA VITIENSIS may appear at infrequent intervals. TRICHOGLOSSUS is common and frequently nests, but is a great traveler over the area principally from banyan clump to banyan clump. HYPOTAENIDIA is rare except in the extreme north where it nests, the underbrush being too open for it, except in that area. TYTO is very common and nest much in the larger trees of the area. CIRCUS hunts over the area a great deal and an odd FALCO hunts it at infrequent intervals. RHIPIDURA FLAB. is very,

very common throughout the whole area and nest all over it. CACOMANTIS is consequently common in the area. There are a number of PETROICAS in the area about a pair to half a square mile, but whether nest in the area or not I cannot say,but I very much doubt it as the nest is quite unknown to the natives, and I have only seen adult birds in the area. The same large swift which hawks over Sewi occasionally appears over the area. Once in 30 odd years after a hurricane a PORPMYRIO appeared in the area. With unsettled and unusual conditions and cold DUCULA may appear and an odd P. TANNENSIS appears in the W end at times.

West Sewi Area. (sub sub area No2. of East Tanna sub Area).
Not to scale approx correct.



EAST TANNA SUB SUB AREA 2 WEST SEWI

WEST SEWI AREA - This area is very small, but containing distinct types of country and a fresh water lake I have subdivided it from other areas. It is roughly circular and about 3 miles in diameter. In the south and east are completely bare ash plain with outcrops of soft red lava rocks in places which form cliffs or steep slopes running up to 350 ft. which is the inner slope of the coastal ridge of the White Sands area. The western half of this ash plain is taken up with a lake of fresh water which varies in size according to rainfall but whose surface averages about 120' ASL., it fills up to 150' after heavy rains. It is fed by 2 large streams, the Efakel and Esaka rivers and by several which flow only in wet weather. When at about the 120' level it is about 1-1/2 miles long by one across and is completely surrounded by bare ash margins. On its west side extensize flats rise gradually into the Eastern Foothills Area, the southern section of these flats being covered with short or clumpy grass which makes good grazing land. The rest of the area is covered by varying types of bush which will be dealt with separately under their heads. This area has no human population. Rainfall 100-120", soil volcanic sand.

BARE ASH PLAIN AND LAKE AREA - This as its name denotes is entirely bare with outcrops of red volcanic soft rocks, probably volcanic mud hardened and with honey comb bombs thrown out by the active parasitic volcanic cone which it lies at the foot of. The lake is entirely fresh as although having no visible outlet to the sea a constant and extensive soakage goes on under the coastal ridge to the sea where it appears in hot fresh springs for some miles along the coastline. This lake is a tremendous breeding ground for dragon flies the larva of which swarm in it. At times the shed cases of these larva form a bank a foot wide and six inches high all along the lee margin of the lake and

rocks and pieces of wood and cliffs, etc. are simply covered in a mass of shed skins. Many small black and brown bull-headed beetles are drowned and wash up along the lee margins supplying much food for birds, as well as numerous other types of insects.

In this area HIRUNDO is common and nest in the red rock cliffs, etc. in fair numbers, no doubt because much silt is easily procurable from the lake margins. On the lake are large flights of ANAS SUPERCILIOSA PELEWENSIS (also 2 other types which are rarer but I haven't got them yet, but are probably NYROCA AUSTRALIS and QUERQUEDULA GIBBERIFRONS). Around the margins are hughe flocks of PLUVIALIS and small flocks of TRINCA BREVIPES and an odd NUMENIUS PHAEOPUS. Constantly harrying these mobs are numerous CIRCUS, eight and ten at a time being common and numerous FALCO appear and often capture ducks but generally ignore the other birds unless ducks are scarce. CIRCUS often stand in the water and feed on dragon fly larva also. An odd HALCYON JULIA may drink at the water's edge and at night odd HYPOTAENIDIA drink and feed along the NW side where the scrub closely approaches the lake. At long intervals a spoonbill may appear on the lake, but these are very rare, once some form of this appeared but I have no record of it within the last ten years. The spponbills seldom remain long, generally falling quickly to a native gun. Except for HIRUNDO no birds nest in the area except on occasional wet years a duck may nest in the stones on one of the three small peaks in the west where they are surrounded by water.

OPEN GRASS FLATS AREA - These grass flats carry vast flocks of PLUVIALIS and a great number of ACRIDOTHERES which feed much around the cattle and horses which graze there. HYPOTAENIDIA is very, very common and nest in the longer tussocky grass, as also does ANAS SUPER. PEL. and I believe QUERQUEDULA GIBBERIFRONS. CIRCUS hunt much over the area and an occasional FALCO appears. Around the scrub margins ZOSTEROPS FLAVIFRONS appears and feeds

on the ground occasionally. There are no fish or crays in the 2 streams crossing this area or in the lake but a species of shellfish and vegetable matter forms food for a few ducks which occasionally feed along the streams.

LOW DENSE TANGLES SCRUB AREA - This is a continuation of the flats but covered with a low scrub principally brown of about 20 ft. in height with little or no vegetation under it but so confused with trunks and limbs, etc. that it presents difficulties to penetrate. It occasionally becomes water-logged and the trees die back, then come again and add to the tangle. The brown? trees have considerable trunks of 14-18" thick but do not grow upright but slope and have many hollows.

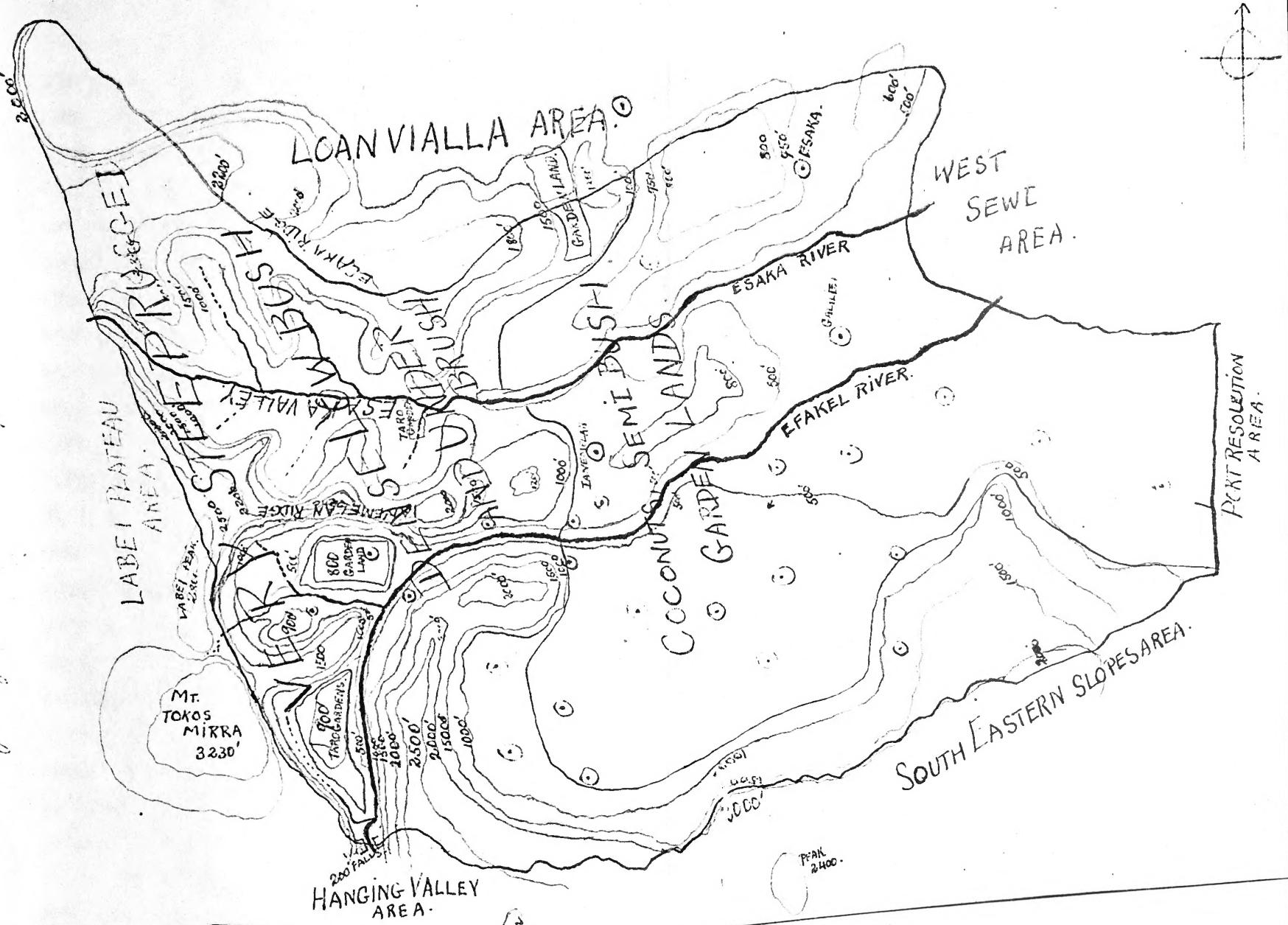
ACRIDOTHERES is very common and nest very freely in hollows, etc. In this area ZOSTEROPS FLAVIFRONS is common and nests though not as numerous in numbers as in the fruit areas. ZOSTEROPS LATERALIS is uncommon and I doubt if it nests in the area. HALCYON JULIA is common and nests. HYPOTAENIDIA is very, very common and nest in numbers and is not nearly so shy as in the White Sands area. TYTO is common and nests in the hollow brown? trunks, and no doubt lives much on the rats which are common in the area (living on coconuts in the adjoining area no doubt). CHALCOPHAPS is present but not common and seldom if ever nests. MYIAGRA is common and nests. RHIPIDURA also being fairly common and nesting and no doubt CACOMANTIS though I have never seen or heard it there. MYZOMELA is present but not at all numerous. Hawks seldom hunt the area it being too dense to present much hope of a kill. A very few native fowls have gone wild in the area but are uncommon and very wary being much chased by natives.

COCONUTS SEMI-LIGHT BUSH - This is a margin area between the low Sewi scrubs and the foothills and has a 60 percent coconut bush with the remainder brou, banyans and a few fruit trees,

there is a good deal of ferny underbrush and canegrass and tree ferns. MYZOMELA is very, very common and nests freely. ZOSTEROPS FLAVIFRONS is also very common and nests much. RHIPIDURA is very common and nests and no doubt CACOMANTIS though I haven't actually seen or heard it there. MYIGARA is very common and nests. HYPOTAENIDIA common and nesting but fairly shy. ERYTHRURA TRICHROA common at times, but I don't think it nests. ACRIDOTHERES fairly common and nest occasionally. TYTO is common and nest occasionally. HALCYON JULIA is not very common and nests. Both hawks hunt over the area occasionally. CHALCOPHAPS is common and nests everywhere. An odd PTILOPUS GREYI is seen and nests. COLLOCALIA ESCULENTA is common and nests in the banyans. ZOSTEROPS LATERALIS is fairly common and nests freely. An occasional COLUMBA VITIENSIS appears but does not nest. An occasional ANAS nests along the 2 main stream margins.

VERY DRY SEWI BORDER - This is principally canegrass and pandamus with bare patches of volcanic ash in between and very subject to fires. It carries a few banyans and tree ferns and low scrub and many ground orchids with odd patches of ferns. HYPOTAENIDIA is common and nests. ZOSTEROPS FLAVIFORNS is fairly common and nests. RHIPIDURA is fairly common and nests, but I have not seen or heard CACOMANTIS there. Hawks hunt over the area a great deal. A few COLOCALIA ESCULENTA are present but don't nest. An odd HIRUNDO hawks over the area and may nest in the cliffs on the north of Sewi. ERYTHRURA TRICHBOA pass through and feed on cane grass in flower but don't nest. An odd MACROPYGIA passes through.

EAST TANNA SUB SUB AREA NO. 3 EASTERN FOOTHILLS AREA




Eastern foothills (subarea of Tanna)
Not to scale approximately correct.
Average height E + S miles 2000 off

etc. 50 percent coconuts with or without light open underbrush, would cover 35 percent of the area and garden lands 15 percent

EAST TANNA SUB SUB AREA NO. 3 EASTERN FOOTHILLS AREA

EASTERN FOOTHILLS AREA - This is an intensely interesting area about 4 miles from east to west and the same N to S and ranging from 400' to over 2000' above sea level. It is roughly like a section of a soup plate with 3 main ribs or razor back ridges running down into it. These ridges from N to S I have named for convenience Esaka ridge, between it and the next lies Esaka Valley. Ianemilan ridge and between it and the next Efakil Valley, then Efakel ridge running out towards the other two and turning to the centre of the plate, between all these ridges and on both sides are almost precipitious slopes like the edge of the plate. The soil is entirely volcanic sand and bombs, etc. with a thin decidious overlay of soil and is drained by 2 main rivers the Esaka and Efakel which drain the main mt. area of Tanna. It is much cut up by storm channels in the flatter parts but all these run towards the center of the plate and are fairly regular in their spacing having steep sides and average 40 or 50 ft. in depth and only flow in heavy rains. The rainfall over the whole area is heavy being from 120-150 inches, being naturally heavier at the hill foot. The area is covered principally by 2 main types of vegetation roughly half of the area up to the 1000' mark being covered by a semi-bush and coconut area dotted with garden lands. The area carries about 1500 people principally in the southern half with a very few in the hillier parts, and the hilly parts which are steep and rugged covered by a low bush of average ht. of 25 ft. and many tree ferns with dense fern, wild kava, wild cane and shrubby underbrush.

SEMI-BUSH, COCONUT, GARDEN LAND AREA -A rough division of this area would be semi-bush (of banyans, fruit and nut trees with open type of underbrush of ferns, wild kava, wild cane, etc. 50 percent coconuts with or without light open underbrush, would cover 35 percent of the area and garden lands 15 percent

of the area, garden lands including 1st, 2nd, 3rd, to 5th and 6th year garden bush intermingled with fig, mango and fruit trees.

In this area 2 ZOSTEROPS are very, very common and nest all over it. RHIPIDURA FLAB. BRENCH. is very, very common and nest and its parasite CACOMANTIS with it. ERYTHRURA TRICHROA is very common and nest. MYIAGRA is very common and nests. MYZOMELA is very, very common and nests. MACROPYCIA (brown phase only) is common and nests, COLUMBA VITIENSIS is very common and nests. PHITOPUS GREYI is very common and nests. PTILOPUS TANNENSIS is common especially towards the southern part but scarcer in the north and nest in the area principally between 400 and 800 ' ASL. A very few DUCLA PACIFICA appear in the southern part and may possibly nest but it has never appeared N of the Efakel River. CHALCOPHAPS is common and nests but becomes least common in the higher parts towards 1000'. HALCYON JULIA is fairly common and nest but favors the lower levels up to 600' more than higher levels. Both hawks hunt the area a good deal, the FALCO being almost as common as CIRCUS. TYTO is fairly common and nests. An occasional stray ROPHYRIO appears on the northern boundary but not often. HYPOTAENIDIA is common and nests but is very shy. There is also a rare black rail, very, very shy known to the natives and once seen in this area by me but very, very difficult to collect even with a pound reward I haven't got one yet. This is probably a similar or the same unknown rail chased by Harrison and myself in the Big Nambus on Malekula. The natives say it is very rare and dying out. ACRIDOTHERES is common and nest in the area but principally in the lower levels near villages. Along the rivers ANAS SUPERCILIOSA PELEWENSIS is very common feeding on weeds, water cress and shell fish found on the rock.

PETROICA appear fairly commonly in the area but more in the higher levels and nests. TURDUS is a rare visitor except in the higher levels where it appears fairly numerously at times. It may nest in odd cases within the area but this would only be close to the border. COLLOCALIA ESCULENTA is fairly common throughout the area nesting in small colonies in banyans. HIRUNDO is present but nowhere common, most frequent along the rivers where it probably nests. HALCYON JULIA is fairly common at times and nests but seems to be a mover in this area. The large swift occasionally hawks over this area but at long intervals. LALAGE LEUCOPYGIA is common and nests throughout the area.

VERY STEEP RUGGED DENSE LOW BUSH - This area cut into by the 3 large ridges Esaka which presents a reasonable road to the highlands. Ianemelan which gives a precarious and steep road to the highlands and Efakel which presents no reasonable road form the main areas of working along with the bottoms of their valleys and a short distance up their sides but much of the area is entirely inaccessable even to natives. There are odd flats and spur ridges which can be clambered about to, but even these present a danger in spiteof vegetation landslides are common and the whole surface, tree roots and all slip off like a skin at times and crash into the valleys. The vegetation for the most part is composed of low trees, venua, bloodwood, tree ferns, etc. averaging 25' in height reaching 40' on flats, etc. with a dense, ferny, wild kava and low shrub underbrush, patches of cane grass and odd patches of bare lang-lang grass 2'6" - 3 in ht. or similar patches of ferns. The whole hard to penetrate and presenting treacherous footings. Ianemelan Ridge and Efakel Ridge are razor backs in places 5 ft. wide only with almost sheer fall on either side for 1000' or more landslides being common, especially in wet weather, when it is too dangerous to attempt them.

lanemelan ridge has 8 recent bare landslides on the N side and 11 on the south side one of which buried a village in the Efakel valley last December hurricane (about Dec. 10, 1935).

The valleys all contain streams or rivers or tricklets mostly over stones. Esaka River being a stony-bedded mountain torrent with several small branches. Efakel valley has a quite considerable river ravine and gorge bed with numerous tributary tricklets and a large 200' sheer fall from the hanging valley area at its head. At the foot of the fall is an extensive pool much frequented by ducks. There are a few taru gardens in the area which make use of the water soaks, etc. for irrigation, but these represent only about 2-3 percent of the area at most.

In the area ZOSTEROPS FLAVIFORNS and LATERALIS are common and nest, but are not as numerous as in a fruit tree area though this area carries a fair fruit (figs, etc.) bush in the valleys and lower levels. RHIPIDURA is fairly common in the lowest levels where it nests, but disappears higher up. TURDUS is very common and nests all over the area even on the steep hillsides. MACROPYGIA brown phase is very, very common and nests throughout the area favoring tree ferns and the Royal Flower of Tahiti tree (a red-flowered, possibly an acacia with small round leaf). The grey phase of this bird goes down occasionally to 1200' or so, but never below as the brown phase does, but is rare at these levels, becomes more numerous at 1800-2000' and increases to fairly common at 2500'. Never nest below 1800' and rarely at that, generally at 2000' or 2500'. The brown phase is very, very common throughout the whole area and up at 2000' and more is one of the commonest nesters and run in a ratio of about 40 or 50 to 1 of the grey phase. CHALCOPHAPS is very uncommon and confined to the ridge tops, it may nest and does on the plateau on top but is rare there also. PETROICA is very common throughout the

whole area and nests. MYIAGRA is fairly common especially on the top of the plateau and ridges and nests. MYZOMELA is common especially when the red-flowering tree is out. An odd COLUMBA VITIENSIS appears up to 1500' but not above that. CIRCUS is a rarer visitor but may nest in inaccessable places on the lower slopes at a 1000 ft. or so. FALCO is very, very common for that species in a single area, as many as 14 being in sight at one time. It nests in landslides (and hollow limbs sometimes) in most inaccessable places and attacks intruders, human or otherwise. HYPOTAENIDIA is present but very shy and easily escapes observation in the ferny underbrush it probably nests. ERYTHRURA TRICHROA is present and common and nests in the lower areas up to 1500'. LALAGE LEUCOPYGIA is common and nests throughout the area, not as common as at lower levels, but nevertheless fairly numerous. Two petrels nest in this area. FREGATA ALBIGULARIS in the steep hillsides from 800-1500' ASL., non colonial but very common in the canyon sides of the Efakel River near the falls and PUFFINUS LHERMINIERI NUGAX all over the area non-colonial from 1200-1500' up to the top of the highest mountains on the island, where it becomes colonia. It is possible other petrels nest in the area but I haven't found any to date and am unlikely to as most of the accessable places have been thoroughly combed out. The population of FREGATA ALBIGULARIS at an approximate guess would be 2000-3000 pairs at most, of PUFFINUS LHERMINIERI NUGAX in this area 1500-2000 pairs, possibly more. They nest in the sides of all the valleys and on the ridges and spurs generally near a distinctive mark such as cane grass or ferns, or light vegetation, which no doubt serves as a guide on dark nights.

The unknown black rail is, natives say, present, but I haven't seen it, but it quite likely is and probably nests.

COLLOCALIA ESCULENTA comes up and is common at the 1200 ft. mark, but becomes scarce after that and almost absent at 1800'. The large swift hawks much in the area when it is present in very clear weather at certain seasons of the year, no doubt on its migrations.

Inakahi area

sub-area subarea of East Tarawera.

Thermal area. fumarole sensitive.

Raised 50' within recent times.

contours in 100 ft.

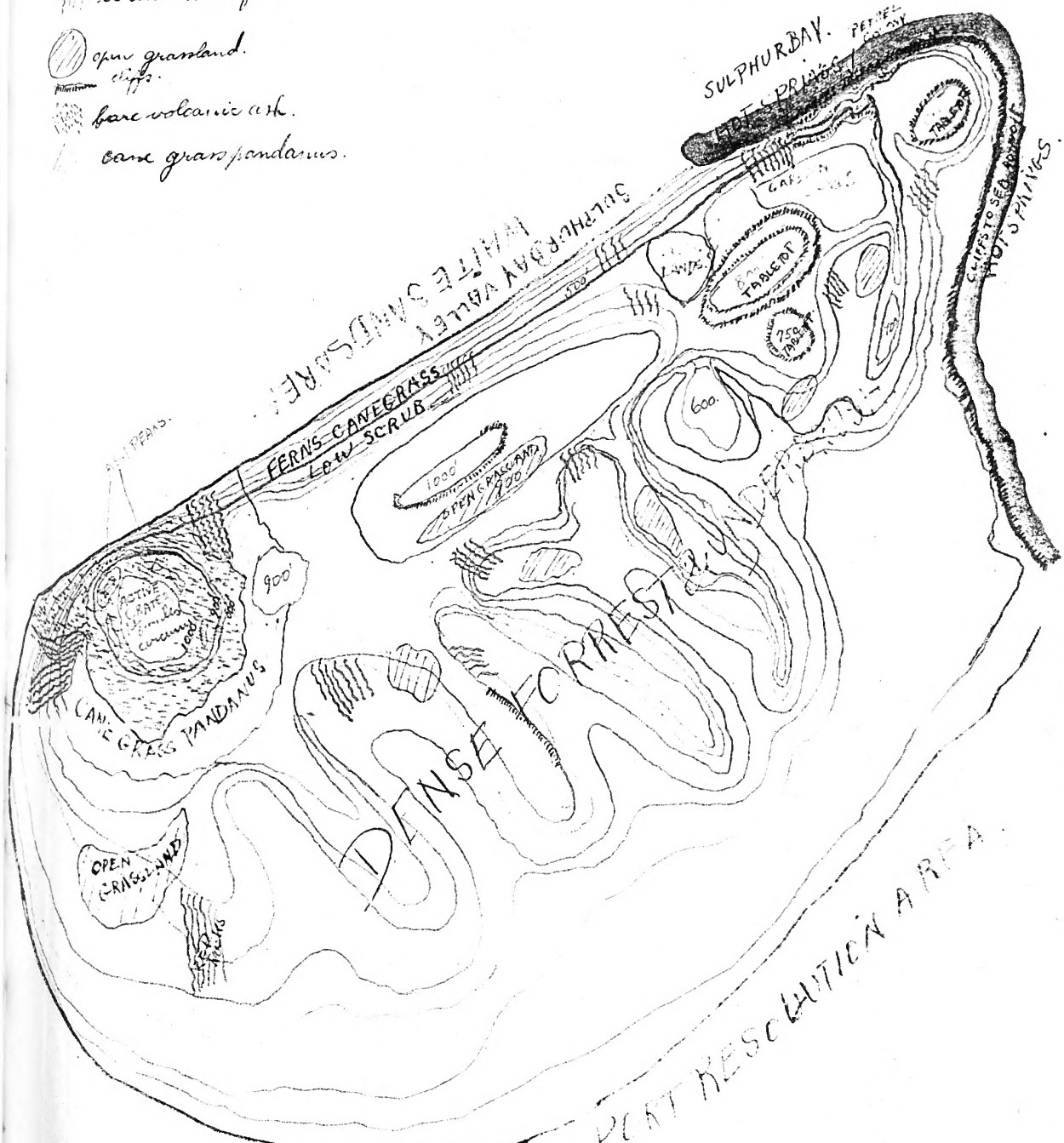
bare red rock flows.

open grassland.

cliffs.

bare volcanic ash.

cane grass pandanus.



EAST TANNA (ISLAND, NEW HEBRIDES) SUB-SUB AREA NO. 5 INKAHI AREA

This area is about 2-1/2 miles long by 2 wide running roughly NE-SW and is entirely volcanic, having hot bare patches, hot patches, fumeroles, etc. all over it and is intensely hot springs all along the coast, large sulphur deposits and an active parasitic volcanic cone in the NW corner of it. This crater is 1-1/2 miles in circumference and has peaks of bare volcanic ash around its lip varying in height and showing to a nicety the amount and directions of prevailing winds..the highest peak being N of W is about 1100' ASL and others range proportionately to the commonest wind direction lee directions (sic). On its NW face it has reached the angle of stability and a ridge has formed down the steep slope caused by the prevailing ES-E to S of E wind. On the west an outflow of lava and volcanic red mud has formed another steep face. All around the crater is a bare volcanic ash area covered with bombs, etc., this is again surrounded by a narrow strip of wild cane and pandamus which widens and shrinks according to volcanic activity and the wind direction. A slight saddle joins the crater peak with a long ridge which runs through the area with a very steep slope on its NW face to Sulphur Bay Valley and the sea and more gradually but much cut up and irregular slope on the SE side. Above Sulphur Bay Valley on this NW face the bush is a low scrub of 15 or 20 ft. with much cane grass, ferms and tree ferns and sinkect to volcanic rain. Odd bare red rock and soil and hot patches are scattered all over the area with fumeroles appearing everywhere and odd patches of open grassland, generally hot soil and in the N-NW are areas of gardenlands, very fertile but the remainder of the area is covered with dense bush and brush and in places 60-80' trees - many fruit and fig trees, ferns, etc. and banyans. The vegetation is very, very luxuriant except where affected by volcanic fumes or ground too hot for it. The whole of this area and the floor of Port Resolution

in which Capt. Cook anchored in 6 fathoms or more has been raised 60 ft. in 2 lifts of 30 feet each within the last 60 years, the last lift occurring about 30 years ago my father saw and the water in the Port rushed across the point on the south side stranding sharks and fish in the trees 20 ft. from the ground (rather peculiar avifauna). Within the area subsidescences and breakouts occur over small areas and earthquakes are often occurring. There is no doubt a volcanic plug in a still unsettled form.

Along the fern canegrass and low shrub slope above Sulphur Bay Valey, the following are present, 2 ZOSTEROPS fairly common and nest, LALAGE LEUCOPYGIA not very common and I don't think it nests, a few MYIAGRA which I don't think nest, RHIPIDURA very common and nesting and its parasite CACOMANTIS. At times ERTHRURA TRICHROA appear but don't nest. A few MYZOMELA which may nest. CIRCUS which nests in inaccessible places and odd visiting birds but generally speaking it is a bad bird area. As is the canegrass pandamus border around the bare ash of the crater peak having only a few ZOSTEROPS FLAVIFRONS and RHIPIDURA and odd visits from ERYTHRURA TRICHROA when the cane grass is in flower. The rest of the area doesn't need dividing as it does not vary to a great extent. No villages in area, rainfall 100 inches.

Treated through (out) as a whole the following would cover it. 2 ZOSTEROPS very common and nesting, MYIAGRA very common and nesting, MYZOMELA fairly common and nesting, RHIPIDURA FLAB. BRENCH. common and nesting, also its parasite CACOMANTIS. CHALCOPHAPS common and nesting, PTILIPUS GREYI very common and nesting, PETROICA common in the higher levels and nesting, (above 500') COLUMBA VITIENSIS common but doubt it nests in area. DUCULA PACIFICA appears at rare intervals in ones or twos, generally after

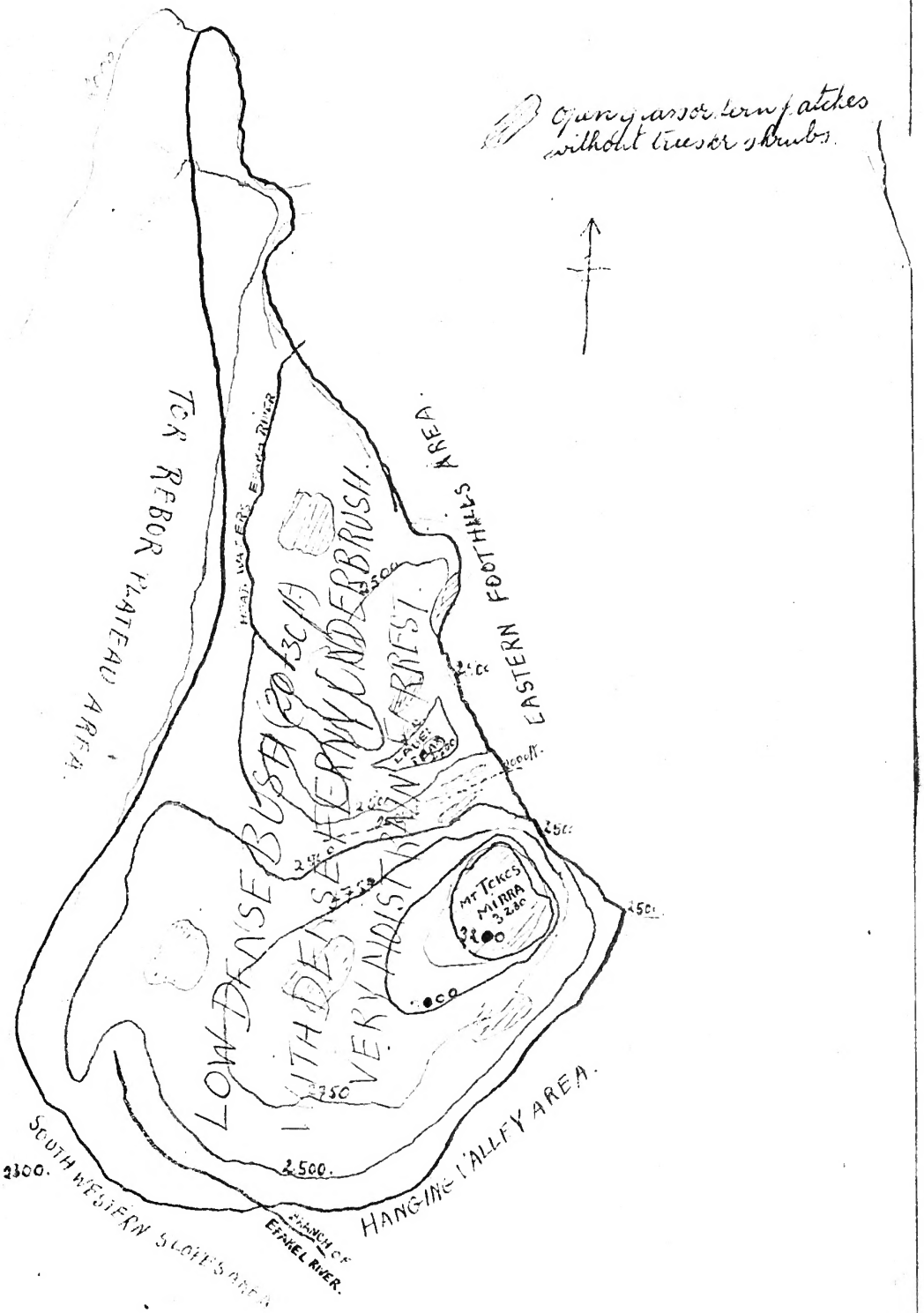
hurricanes. A very odd PTILIPUS TANNENSIS appears under similar conditions but neither bird every nests. COLLOCALIA ESCULENTA is very common and nests in small colonies in banyans and possibly in caves. A few HIRUNDO are present and nest but principally around the coastal cliffs. HYPOTAENIDIA is present and common and nests. HALCYON JULIA and TANNENSIS are present and fairly common and nest. TRICHOGLOSSUS is present and common and nests a great deal. A number of native wild fowl are in the area but very shy and wary, possibly MEGAPODIUS is present but I doubt it as the boys don't seem to know it at all TYTO is very common and nests. CIRCUS very common and nests frequently FALCO is present and may nest occasionally, harries the petrels somewhat no doubt (see my notes on petrels on Liaka Is. Harrison and McMillan 1/2/35). ERYTHRURA is present and at times common, I don't think it nests, but possibly does. LALAGE LEUCOPYGIA is common and nests. A large dark shearwater nests in a small colony on a cliff ledge 40 ft. above the seas on the NNW face. This colony was larger but landslides and earthquakes have eaten into it till it is now very small, although suitable places further along are neglected. As far as I know they don't nest elesewhere in the area on Tanna and I don't think any other species of petrel nest in the area, although it is most difficult to cover thoroughly and has many suitable spots. But the boys know of none though that in this case is unreliable as it has too many taboo areas (and) parts of it are unexplored or inaccessible. I have covered all the reasonably safe taboo areas, some being too thin and dangerous (so) I couldn't do but its too hot for birds too I guess. 3 of the flat tabletops are inaccessible and taboo, the largest managed with ropes, etc. but found little of interest except a CIRCUS nest and 2 old ones. A few DEMIGRETTA are found

along the coastline and an odd one nests in trees along the cliff but they are not common in the area, though they nest principally along the Port Resolution side where they can cross over and feed free of the hot springs which drive away their food. A few TRINGA BREVIPES appear on the rocks along the coast occasionally but are not numerous.

# Labei Plateau area. Yanna

sub-sub area D of sub area South East Mts

Not a plateau in the real sense but a highland area.
Very very rough & rugged, much intersected by storm channels &c.
Contours not true but roughly were sketched would be too confused.



TANNA SOUTH CENTRAL MOUNTAINS SUB-SUB AREA 1. THE LABEI PLATEAU

Labei Plateau which is not a plateau in a true sense but a highland much traversed by deep, steep-side valleys. It contains the highest point of Tann in Mt. Tokos Mirra, 3230' ASL. Mt. Tokos Mirra is a smooth round-topped mt. falling steeply in the NE and East almost sheer for 2500' into the Efakel valley and fairly steeply in the south to a river valley, on its other sides in slopes gradually to other and lower levels these slopes being much cut up by deep storm channels, north of it is a small sharp peak called Labei which rises to about 2800' from a more or less flat highland of 2500 feet which is divided by a narrow deep valley of 2000' ASL from the 2500' area of Mt. Tokos Mirra. The whole of this small area is above the 2000' ft. mark and the greater part is over 2500'. It is a very fertile volcanic soil with a deep overlay of mould and decidious soil carrying a dense vegetation of low trees of 20, 25, and 30 ft. principally the red flowered royal flower of Tahiti tree (poss. an acacia) with a very dense ferny and shrubby underbrush of wild kava, musk orchids, shrub, etc. In the valleys larger trees are found but the same underbrush, banyans? are very rare and at lower levels only, in deep valley or storm channel bottoms, but a number of trees bear fruit different to lower levels.

A true contoured map of the area would be most confused as eastern rivers have decapitated the W systems and the true watershed lies well down the W slopes. 500' gullies are common with only a razor back ridge dividing them and the ridges are only a matter of a few chains apart but sides and bottoms are all densely covered by vegetation. There are a few patches of open grassland or ferns without trees or shrubs, the largest being on the extreme summit of Mt. Tokos Mirra. A branch of the Efakel R and the headwaters of the Esaka R rises on the W

slopes of this area. The whole area is very damp and moist, being often shrouded in cloud mist. The rainfall must be over 150' and moisture is well held by vegetation. A few pandamus appear in the area but unlike some other mt. tops in the group are only a very small percentage, perhaps 1/2 of one percent of the vegetation.

There are not villages or inhabitants in the area and only one precarious track across it from Ianemelan ridge head to the SW coast well south of Lenakel.

In the area 2 ZOSTEROPS are common and nest but not as common as in the lower fruit areas. MYZOMELA is very common and nests. MYIAGRA is very common and nests. PETROICA is very common and nests. RHIPIDURA FLAB. BRENCH. is not common and generally only in deep gully bottoms. HALCYON JULIA is rare in the same kind of place. TURDUS is very common and nests as does HYPOTAENIDIA but neither bird is easily seen. The unknown black rail is also present but rare, commoner than lower down but nevertheless rare. MACROPYGIA, brown and grey both nest, the former being very, very common and the latter fairly common. DUCULA PACIFICA is common throughout the area especially about the 2000' mark where it nests in great numbers. FALCO is a common hunter in the area. LALAGE LEUCOPYGIA is present and fairly common and nests but principally below 2500' marks. On the extreme top of Tokos Mirra is a large colony of PUFFINUS LHERMINIERI NUGAX and scattered non-colonial below the peak are many other burrows getting more scattered the lower one goes, odd ones nest scattered all over the area in suitable hillsides. The large swift appears here occasionally.

ANIWA ISLAND (INCLUDED WITH TANNA)

Aniwa Island - This island is about 4-1/2 miles long by two broad and lying approx. 169 degrees 35' E Long...19 deg. 15' south latitude. It is entirely formed of coral uplift with a thin skin of decidious soil mostly very shallow overlaying it. It is very subject to drought having a rainfall of about 50 inches only. It reaches a maximum height of about 135 ft. ASL, and is principally a main highland ridge running NW and SE with coastal flats on each side. It nowhere carries a very dense scrub and much of the island is covered with a low hardwood scrub of about 20 - 25 ft. height which has an open nature with short grass and shrubs underneath it in places extensive grasslands are found. The total area including a large tidal lagoon would be approximately 5000 acres and this lagoon area takes 1200 acres off this leaving an area of 3800 acres to support 350 people. Their 1st, 2nd, and 3rd gardens cover perhaps a thousand acres or less including a good deal of coconuts, other coconuts cover perhaps 500 acres leaving at most a little over 1500 acres of true original bush. The garden lands have many fig and fruit and trees and odd ones are scattered all over the island forming a plentious bird food supply. Many introduced cedar trees are growing and rapidly spreading over the island. Banyans are numerous but not as numerous as in the White Sands, Tanna areas; it (banyan) and candle nut being the biggest trees. Around the coast are extensive old reef tops which form a large feeding ground for waders and herons and sea birds as also does the large tidal lagoon.

Of land birds both ZOSTEROPS are very, very common throughout the whole island and nest, some areas show a slight decrease in numbers but this no doubt varies by seasons. LALAGE LEUCOPYGIA is very common and nests throughout the whole island but decreases in garden lands favoring the hardwood scrubs. MYZOMELA is very, very common and nest throughout the whole area showing a slight

decrease in the hardwood scrubs. MYIAGRA is very common in all areas and nests. PTILOPUS GREYI is very, very common all over the island except the lagoon area and nests. COLUMBA VITIENSIS is very common especially in garden areas, but only a few in lagoon area and nests. CHALCOPHAPS is not common, 300-500 being a rough estimate of the whole island and being perhaps on the large size, it nests. HALCYON JULIAE is very, very common and nests. HALCYON TANNENSIS is not very common and favors the hardwood scrubs more, it nests. TYTO is fairly common and nests.

Casual visitors are CIRCUS and FALCO from Tanna generally in clear weather, but never remain long. TRICHOGLOSSUS also appears at times but soon disappears, does not nest. DUCULA PACIFICA appears accidentally but doens't breed; there were two on the island when I was there. CHALCITES LUCIDUS LAYARDI is present and probably breeds. Two birds the boys know I failed to get while there were possibly FUDYENEMIUS TAHITICA and CHALCITES LUCIDUS LUCIDUS.

Sea birds - DEMIGRETTA is present in numbers, but I only saw blues, odd whites do appear according to boys. It breeds occasionally on the island about an average of 3 pairs a year as far as I can make out. Numerous terns and petrels are seen working the breaking waves along the reef edges. Of these I secured and definitely identified STERNA BERGIL and STERNS SUMATRANA, the latter breeding on the island yearly. At least 2 pairs last season both of which nests, eggs and young were destroyed by the December hurricane. Boys say occasionally STERNI BERGI nests at long intervals and this is possible and quite probable. Others I saw and am fairly sure of identification were FREGATA ARIEL, the 2 larger of the 3 petrels which nest on Tanna (P. PACIFICUS and P. LHERMINIERI NUGAX), STERNA ANAETHETA, and a black tern which I was not so sure of but looked like STERNA FUSCATA and both PHAETHON RUBRICAUDA and LEPTURUS, which there could be no mistake about. These birds often nest on the island according to the boys.

Waders are very numerous in the tidal lagoon and on the reef top. Identified positively were PLUVIALIS, very, very common; TRINGA BREVIPES, very, very common; NUMENIUS PHAEOPUS, common; LIMOSA LAPPONICA, fairly common; also a large variant. AR NARIA INTERPRES, very common. It is almost certain from boys and my own observations that BUTORIDES is sometimes present and I have no doubt DUPETOR FLAVICOLLA is also present at times

# ERROMANGA ISLAND GEOGRAPHICAL DESCRIPTION

(by L. Macmillan)

Erromanga is composed geographically of three main sections and three sub-sections roughly. These are as follows: in the North Mt. Williams 3000 ft. and the mountain chains and peaks connected with it to the north and east of it, and the main low volcanic ridge running north and east about (800-1000 ft. high) and joining up with the sub-section of the extinct volcanic peaks of Traitor's Head which reach a height of 2700 ft. A sub-section of a low saddle (600 ft.) which leads across to the southern mountain group of Robinson Robertson's Thumb. (2) Mt. Gordon and Martin (undefined) where peaks reach 3000 ft. or more, and the sub-section of the isolated peaks lying to the south of them, across portion of the South River Basin. The third main section is the raised coral terraces to the north-west, south-west, south-east and portion of the east coasts of the island, these vary from 600-1000 ft. in height and are composed of 3 main lifts of approximately 300 ft. each. These coral uplifts form cliffs in many places, almost sheer for 1000 ft., all along the west, south-west, s. and s.-e. sides of the island with only a few small level flats at their bases, at the mouths of rivers and at an occasional point. The east (Cook's River) and the n.e. (Potnuman & Potnasivsiv?) areas have gradual rises to the hills. The coral terraces form extensive plateaus which are more or less level (Peni? plains) especially in the south reaching from the southern mts. to Ifwa Bluffs? in the extremes S.e. of the island.

There are three main river systems with many small rivers around the greater part of the coast line, the only really long stretch being along the s.w. and s. coasts, where no rivers occur from South River to Ifwa River. The 3 main River systems are:

the Cook River following to the east into Cook's Bay; probably the largest river on the island. This drains the s.e. slope of the northern mountain area, most of the low saddle sub-area and all the southern sides of the Traitor's Head sub-area, and a great deal of the northern faces of the southern mountain area. William's River which drains the s.w. and the s. slopes of the northern mts. and a portion of the northern faces of the southern mts. South River, the most extensive river system of the island, which drains the greater part of the southern mts. and a great deal of the Ifwa table-lands. All these rivers except the Cook and a few small streams in the n.e. flow to the sea in deep gorges especially along the west and s.w. coast is this true. The soil is volcanic and easily eroded and rivers have cut themselves very deep channels (subject to rapid rises and floods,) and have cut up the country very much making it very rugged in places, and in the coralline lower reaches sheer cliffs of up to 1000 ft. are found in a few places, but 600 ft. cliffs and gorges are common. The scenery in places is simply magnificent.

A look at geographical features point to Erromanga having once been two separate isolated volcanic peaks, rising above the sea, coral has formed along the margins and been lifted at various intervals. To the east I believe when Traitor's Head appeared all the coralline formation was destroyed and only now are fresh ones forming along the present littoral especially in the Cook Bay which is shallow. The Mt. Williams's group of mts. in the north show a huge crater which after having become extinct formed a big lake which burst out to the s.w. and formed the valley now drained by the Soki River. Mt. Williams itself, being the highest peak on the water crater rim opposite the prevailing s.e. wind. Water action is visible in places on the inner side of this crater. Several definite craters are still visible in the southern mts., but this group of mts. was more a group of small

volcanos close together. A line of craters can also be followed along the ridge between the n. mountains and Traitor's Head, the peaks of Traitor's Head show craters, all exept the extreme easterly three which were all originally one big volcanic peak which when seen today from the south present in combination a perfect volcanic cone

(sketch

but from the east appear as three separate peaks (sketch)
To the east of the Traitor's Head soundings show a submerged volcanic peak and Goat Island is a volcanic peak, or rather portion of one as an explosion has removed most of it, a deep water crater being on its west side and the only possible landing place is on the east or n.e. side. Numbers of the isolated s. peaks of the island show perfect craters, one having a small swampy lake in it.

In passing it may be of interest to mention that the natives of Erromanga have a folk lore tale that once upon a time Tanna Is. had no volcano and Erromanga had, but the Tannese built a big canoe and came one night and stole the volcano and towed it back to Tanna with them, where it has since remained, which points to the fact that either the Erromangans had a pretty good geologist among their story tellers, or that there was still active volcanic action in fairly recent times, which as a matter of fact the signs definitely point to in the Traitor's Head area, but there was no visible volcanic action anyway at the time of Capt. Cook's visit.

One especial tree that is on the island also points definitely to the theory of 2 or possibly 3 isolated volcanic peaks forming the island and later the coral terraces rising by volcanic uplift. This is the kauri pine. A glance at the accompanying map shows the southern mountain group on its southern face has

ridges jutting out towards the south. When Erromanga was only a group of isolated peaks, some current, possible the Fiji current, which now flows to the east of the island, which I believe is joined by a current from New Zealand somewhere soth of New Caledonia, carried seeds and these mountains presenting a cross barrier with the ridges as traps caught and retained these seeds. Consequently all the n. faces of these mts. have ? extensive Kauri Pine forests on them. The oldest trees are along a well-defined level line about about 2200 ft. above sea-level today, and trees below them show the various stages of growth right down to small ones on the coralline plateau. Lines of water-born seeds and their generations are distinctly shown and easily traced to some one original old patriarch. Also a few scattered ones are found to leeward from the prevailing wind, but these do not show so well nor are they so extensive. These old trees must be 2000 yrs. old and more, being up to 15 ft. in diameter. Their branching systems seem to point to the forest on Erromanga having been much shorter in their young days as they branch profusely at 20 to 30 ft. and the present day forest about them runs to 60 - 80 ft. Following the successive stages of propagation down the water channels one finds the trunks going up 40 ft. before branching and lower down the mts. 60 ft. and lower still 80 ft. barrels without branches. Thereabout the Kauri attains its usual habit of raising its limbs well above the general forest level and standing out very conspicuously from the other forest trees. Along the margins of each of the coral uplifts further lines of trees of much more recent growth show and these are just commencing their second and third generation of trees. Below them on the upper terrace and on the middle only the 2nd generation and that very young is shown (Lower terrace has none??) Across the coralline plateaus

scattered Kauri at wide intervals is found. North of Bunkel? Only one or two isolated trees appear and perhaps half a dozen are found in the whole northern mt. system, none at all on the Traitor's Head system, and only an odd one on the eastern's slopes of the northern mts. The area of intensity of Kauri Pine is in the south river basin head waters and principally among the ridges pointing south which with the main range have formed pockets and trapped the water-born seeds(?) It appears likely that with Kauri the percentage of germination and survival is very very small possibly .000001 and only in place where enormous numbers of seeds were trapped could extensive areas of such forest eventuate. A rough estimate of timber available for milling in this area was made by me and this worked out at about 10-15 million super feet. I might mention that this valuable timber's presence was previously unknown even to a resident of 30 yrs. on the island. The country is very rugged and presents no attractions to visitors and is uninhabited, and it was purely in the course of my work that I discovered the existence of these forests. Three of the native porters with me didn't even know there was Kauri Pine there and the 4th had heard of it, but never seen it, having lived all his life on the coast at the mouth of the South River.

It is interesting to note that Aneityum Is. which also has extensive Kauri forests has a trap formation in its mountains facing south, and it is in those valleys that the Kauri is extensive, whereas around the north sides west and east only a few scattered trees are present. Also in the s.e. New Caledonia where extensive Kauri is found a similar trap valley system is seen. Aneityum looks to me to be at present in the exact stage Erromanga was before the first big submarine rise took place and lifted the

whole island. I have been told by a Kauri Pine miller? that Kauri grows only near sea level and not above 1000 ft. On Erromanga it starts at 1000 ft. sparsely and is thickest from 1500-2000 ft. ASL and it apparently is flourishing. Some of the trees above 2000 ft. must be an enormous age. I have never seen trees as large anywhere else, except photographs of one or two in New Zealand, I have seen Kauri in Vanikoro, Aneityum and New Caledonia. On Tanna the southern mts. have not the trap formation and there are only 3 Kauri trees in the area.

The absence in the n. mts. of Erromanag where a trap formation is present would be accounted by the deflection of the current by the back water on the n. bases which is actually the case as the few trees present are north of the Soki River. Traitor's Head area is too recent a formation to have caught any seeds which much have been carred at a time very far distant.

It is very probably the same current which bore the seeds for Erromanga (also) carried them and under suitable conditions caused the areas on New Caledonia, Aneityum, Vanikoro to be started. Having seen all the New Hebrides islands I found isolated Kauri Pine on other islands but the general trend of mts. of the group has not been inducive to trapping seeds. Also the most southern islands would have a better chance as they would receive the current sooner. At the present day I understand the Fiji current and its tributary sothern current flows some miles east of the N.H. grop, and north of the Banks Ids. sweeps more westerly across towards Vanikoro. It is possible that the Erromanga Kauri is a different species than the New Zealand but it is the same as the New Caledonian, or very closely similar, that I personally know. In which case it would appear as if New Caledonia was the parent area, but, judging by the trees, Erromanga appears a much older area than I have seen in new Caledonia; also N.C. areas are all at low levels.

DESCRIPTION SUB AREAS SOILS AND VEGETATION VARIATIONS

For purposes of description and easier understanding of the soils and vegetation it will be easier to describe Erromanga in 8 main sections though actually some of these are exactly the same or very similar; there being really only three main types of differences, i.e., plateau grasslands, mountain forest and lowland and plateau forest. The 8 main sections I give as follows:

1 - Western grassland plateaus - consisting of Numpulu(?), Unapong, Umbonkora, and a small area to the south of it, and also the Susuefate area in the extreme north which is not grassland but carries a low forest or scrub.

2 - Northern mountains and their foothills.

3 - Potnarivin and Traitor's Head area.

4 - Central lowlands saddle and Cook River area.

5 - Southern mountain area - northern, southern and s.w. slopes.

6 - Southern mountains - eastern slopes.

7 - Rovilian area

8 - If a tableland comprising all the southern part of the island, and the districts of Ifwa and Numaunoreua.

1 - WESTERN GRASSLAND PLATEAU - These areas stretch from the north of the island, where they are narrow, right down the west coast to a spur of mts. running off from the southern mountain massif, and for a short distance beyond this spur. Roughly the western 1/3 of the island. They are not true plateau or tablelands but are much cut up by deep gullies and valleys. These grasslands are really more a savannah type of country as patches of hardwood scrub are found all over them, and most of the gullies are filled with dense scrub, mimosa, and such like scrubs. Much of the area is used as a sheep station by the only pastoralist in the New Hebrides group. Plateaus are from 600 - 1000' ASL, falling almost

sheer to the sea.

The soil is a red calcarious loam over pure coral throughout the entire area except in one or two places where there has been a slight admixture of volcanic loam and at the foot of the sharp peaks in the south where silt has washed down and overlayed the calcarious loam. Along the eastern border in 90 percent of the area it is just as if a knife cut has divided the two types of soil. Very often a small stream has followed this division mark and one bank is one type of soil and the other bank the other. The main orth fork of the William River has done this right from where it turns south behind Elizabeth Bay to where it turns west again behind Dillon's Bay. The volcanic soil being softer and deeper has worn down more rapidly and has left an extensive valley about 600' ASL behind the coralline ridge of 1000' which forms the region of Unipong. Thus the Williams River, Soki River and Johnstone River all reach the sea through 1000' gorges showing a coralline upper layer over volcanic base in the lower 400' of the open faces exposed. The soil is fertile but being over the porous coralline stone is subject to rapid drying, especially in such places where outcrops occur or where the soil is only a few inches deep over pure, rotten coral rock. In some of the deep, steep, side? gullies which were probably originally spaces between coral patches, swamps have formed, generally behind a bar of rock-volcanic or coralline - where silt has accumulated to a considerable depth. In several places along the margins of this area, especially where it adjoins the lowland saddle foot of northern and sothern mountains, small areas of an infertile soil carrying a scanty vegetation or none at all appear. These are in one or two instances area of boiling volcanic mud, which has solidified; but are principally caused by heavy erosion which has worn down to a hard sterile sub-soil, whic has not had time to be

broken down by the elements to a suitable condition for vegetation. These appear as bare, red patches of soil or carry a scanty brachen fern covered with a few stunted trees and shrubs. Silts in rivers, etc. show traces of copper and in one gorge a scanty, weak sign of mother earth of nickel ? is present, but generally speaking I think Erromanga is lacking in minerals of any sort, except magnetic iron, and odd small patches of sulphur.

Vegetation throughout the area is mostly what is called locally coral grass, a blady grass with feathery seed tops which grows to about 2'6" to 3 ft. in height then lodges and tangles very much. An introduced seedy grass of a creeping variety which has objectionable spear seeds, native clovers of 3 varieties and odd patches of grass introduced by the pastoral pursuits. Low shrubs and weeds, low shrubby bushes many of which have flowers and a hardwood tree locally named Mori, belonging to the Acacia family. In the deep, steep side gullies a dense, low shrub grows, in many places entirely of a Mimosa introduced from Mayaya (MIMOSA PUDEREA?) which is becoming a pest in many parts of the area, encroaching on grasslands and even killing out native forests and shrubs of the shorter type. In the north there are several square miles of nothing but this Mimosa shrub behind the Elizabeth Bay. The Soki and Williams River valleys are choked with Mimosa with a few of the taller native trees among them. The Mimosa grows very densely in close bar poles to about 15020 ft. in height and sheds its leaves which are small, round, feathery, and undoubtedly enriches the soil and increases insect life.

Along the coastal cliffs tall forest grows in any place where vegetation can gain a footing, many banyans being found here, coconuts also grow to some extent. There are numerous caves in these cliffs and steep slopes of coral. Swifts use these for nesting and previously natives practiced cave burial in these caves. There were also a shelter in hurricanes and times of war to a cetain extent.

The grasslands from times long before arrival of Europeans were subjected to burning, as villages in these areas burnt the grass to destroy the cover it made for enemies attacking, and also used it as a means of defense and attack. Child-like they often started fires for no more reason than the wish to watch fre run. Even today a few fires are caused in this way. At the present time all the area used for pastoral purposes is subject to fire at least once every three years as the pastoralists is is badly understocked and the grass soon gets beyond a suitable length for sheep and even cattle. After a time it gets rank and lodges in a tangled mass which the pastoralist burns every 2nd or 3rd year. This burning, though it kills the Mori or Acacia which is then growing causes the hard seeds to crack and a vigorous growth of seedlings and succers cover behind after the first rains. This (Acacia) is rapidly spreading and slowly reducing the grass areas. The pastoralist tells me he believes at least 20 percent of the area which was formerly grassland is now covered with Mori shrub, and this within the last 20 years. The constant fires I believe are the main reasons why no real tree form of grassland bird-life is present, such as TURNIX or any grassbird.

Susufate area in the n. is almost solely covered by Mimosa shrub and a low hardwood shrub in certain less-fertile areas. This shrub seldom reaches a height of 20 ft and averages 10-15 ft. except in certain gullies. It carries a fair amount of bird life, but the absence of fruit trees causes a number of fruit eating birds to be low in the area.

Through the whole area fruit-trees, banyans, figs, oranges, guavos, a sticky seeded fruit (like a small, pale, pink, hairless gooseberry) is very common, and other types of fruit trees are fairly common. Numerous seeding and fruiting shrubs and berries are also common.

The average rainfall for the area over 30 years has been 60 inches. At times as high as 80 i. and others as low as 40 in. Aug.-Nov. the dryest months, some years less than 1 inch falls during that time. Feb.-May are generally wet months. This from actual records.

The climate is healthy and except near swamps and in valleys free of mosquitos and fever. Temp. ranges between 90 and 65 F. in the day and 80-48 F. at night during the year. During Dec.-April temp. are between 90 and 75 and for six months between 80 and 60. During July and Aug. and sometimes Sept. range between 70 at day and as low as 48 deg. at night. The average temperature is about 75 or 80 deg. day down to 60-65 at night. These temp. are taken 900' up on the grassland plateau at the Grayer's homestead.

2 - NORTHERN MOUNTAINS AND THEIR FOOTHILLS

This area is really a very large volcanic peak with steep sides and a base around their foot slopes of gradual slopes of washed down silt, especially is this so on the east and west and south-west sides. North and s. west of them is a small area of heavily eroded soil in which subsoil is exposed and is somewhat sterile. The crater is broken out to the s.w. and drained by the Soki R. Just outside each side of the entrance is a long, low silt terrace formed thus:

They carry a bracken and hardwood scrub and a type of low-flowering shrub. The mt. soil is deep volcanic loam over loose volcanic floaters and stone very deep down, and consequently erosion is deep and only held by vegetation.

The rainfall is heavy especially on the s.e. and e. slopes where it is probably 120 in. a year.

Tall forests of many usual kinds of tropical softwood and a lot of hardwood and sandalwood especially in lower levels. Towards the summits it is 60 percent a kind of smooth barked tree common on Erromanga and Aneiteum the bark of which can easily be peeled for house making in sheets. It has a heavy resinous or rubbery sap. In the higher levels and in gullies there are a lot of ferns and underbrush, but much of the area has comparatively bare ground between the close growing tree trunks. Numbers of wild cattle, wild dogs and wild pigs roam the area and help to keep down vegetation. The vegetation is luxuriant but not as much so as on most volcanic islands, and in many place soil seems to have been rapidly eroded down to the lower soil levels and consequently less fertile soil.

There is little variation in the vegetation throughout the whole area except the s.w. sterile soil areas, and other foothills in smaller patches. None of these patches appears in the east where the vegetation on the coast is really normal tropical and luxuriant with dense underbrush ferns, shrubs, etc.

There are numbers of fruit and seed-bearing trees, especially a type of wild red plum and a red fruit with heart shaped seed (large) much relished by the pigeons. Many fig trees but few banyans. Molluscs abound in the ground vegetation.

3 - POTNARIVEN AND TRAITOR'S HEAD

This is a long volcanic ridge with numerous volcanice peaks running roughly east and west and reaching 2000' and more in 3 big peaks at the eastern end. This is a definite backbone ridge being a watershed running off the main northern mt. chain. Signs of fairly recent volcanic action are visible, and the country looks much younger than the rest of Erromanga. Erosion has not been very pronounced as elsewhere. The soil is very rich volcanic loam without stone anywhere. Rainfall from 1892-1915 averaged 120-130 inches.

There is a much higher average temp. than the insides of the island, more steamy and tropical, probably 90-70 deg. (range) throughout the year and averages between 75-80 for the year.

The whole area is covered by a dense tropical growth of forest with much scrub and underbrush except on certain very steep slopes of the higher peaks of Traitor's Head where a low 20 ft. forest with very dense underbrush is found. The greater part of the area has a tall 8-90 and more foot forest with a 2nd canopy of lower types of trees at 40' not so dense and a log ground scrub of Pandanus, low shrubs, etc. and throughout all a vigorous growth of vines, convolvus?, etc. Throughout the area the Nagalat or Nunglat the large-leabed, soft-wooded nettle or stinging ree is found and is very common, unlike much of the rest of the island where it is rare. Nowhere could one go more than a few feet off the all ready existing tracks without having to cut their way with knives. This area is very similar to much of the south of Tanna and other northern New Hebrides Islands which are volcanic.

Banyans, figs and fruit trees abound and the ground scrub carries an enormous amount of insect life and molluscs. Orchids, both tree and ground, are common and numerous flowering trees and shrubs are found.

4 - CENTRAL LOWLAND SADDLE AND COOK RIVER AREA

This is a lowland gap extending right thru the island north-east and s.w. from 600-800 ASL, and much cut up by gullies and ridges at all angles and rising on north and south into the foot-hills of the two main mt. chains. In the east it slopes away gradually to the Cook Bay foreshore and in the west ends abruptly at the Williams River valley. The soil is a mixture of sterile volcanic red subsoil, this especially in the western part, a rich

volcanic loam, volcanic rocks, and in places a hard volcanic mud. Rainfall is about 80-100 in. in the E. and 60 in the W. I imagine. Climate is much as the grassland plateau except in the coastal eastern part which has higher night temperatures and is a steamier climate. Vegetation is very, very irregular and mixed up. On poor soils a scanty bracken fern with scattered hardwood trees and causerinas? with numerous completely bare patches of red soil throughout, grassland areas, patches of low forest, and in certain fertile areas tall forests of 60 ft. with scanty underbrush. In the Cook R. area it is normal tropical forest with dense ferny, scrubby underbrush on a fertile silt. Generally speaking the western portion is sterile scanty scrub but fertility increases towards the east where real tropical forests and growth are encountered. The western portion carries a scanty bird life, a few ZOSTEROPS, LALAGE, MYZOMELA and a number of ralls in the bracken fern. Bird life inceases as one travels east. In the center and east numerous banyans, figs, etc. are found and insects and molluscs increas though there is also a certain amount of mollusc life in the bracken fern country also. This area is very confused in contour and in vegetation, patches of sterile ground and scant scrub appearing in the center of tru tropical fores except in the extreme east and west where the two extremes appear.

5 - SOUTHERN MOUNTAIN AREA - (northern, s.w. and southern slopes)

This is a rugged mountainous area of volcanic peaks with a narrow raised coralline strip along its s.w. side, but even here the soil is volcanic, a rich fertile silt deposit. The actual mountains themselves are much the same as the northern mountains as regards soil and vegetation and are more fertile and though showing much erosion carry a great deal more underbrush though it is nowhere dense except in valleys and along the coralline coastal

strip where the underbrush is very dense. These hills have numerous streams and are exceedingly well watered, deep gorges and valleys being very common. Rainfall is from 120' upwards, I believe. Climate is cool and very healthy and much of the area is above 1500 ft.

Vegetation in this area is very similar to the Northern mountains, especially in the higher levels and the same resinous skin-wood tree predominates, but there are also extensive areas of Kauri Pine found here, unlike the northern mts. whic have no Kauri to speak of. Generally speaking the underbrush and shrubs are denser throughout the area especially in valleys, ferns being common, also ground orchids and tree orchids. The area is somewhat intermediate between the North Mts. and Potnariven areas but near the Northern Mts. type. Banyans are common at lower levels, fruit trees, figs, flowering trees and insect life are abundant, as are molluscs.

Along the s.w. coralline strip underbrush is very dense not quite as prolific as Port Nariven but still very dense. This area also carries a good deal of the native population of the island possibly 45 percent and their gardening activities make small areas of native garden lands but these are very minute and probably don't represent one half percent of the area.

The whole area is very rugged and picturesque great extremes of height appearing in a few hundred yards. It is probably the most interesting area ornithologically speaking in the whole island. Except for CIRCUS all forms of bird life present on Erromanga could be found in the area and mostly fairly numerous or common, even CIRCUS may visit the area although I saw none.

Caves appear and are numerous along the coastal cliffs. These cliffs are in places bare but where vegetation is present it is identical with the western grassland plateau cliffs further

north, though possibly vines are more numerous here, but both areas have plenty of vines and creepers. Swifts nest in these caves.

6 - SOUTHERN MOUNTAINS - eastern slopes

This area is small but the vegetation is so different that it requires a separate description. It is in two main parts, a narrow coastal strip very fertile composed of soil washed down off the eastern mountain faces and retained by the coralline ridges along the coast and the eastern fill faces which are a semi-sterile sub-soil. Rainfall is heavy these being the weather slopes presented to the prevailing winds and the rain bearing n.e. wind. Probably 120' or more per year. Climate is the same as the southern mt. area except along the coastal strip.

Vegetation on the flat lowlands is a very luxuriant forest of 40-50 ft. trees, lower tangled masses of brown bastard cotton, and dense underbrush ferns, shrubs, etc. The eastern hill slopes are a tall but open 60-80 ft. forest mostly the resinous bark tree with little or no underbrush and much bare ground, and in places scanty hardwood scrub and bracken fern.

Fruit trees are not common and bird life is not prolific except in the lowland strip. Once one crosses the ridge the increase in bird life is most noticeable. Numbers of sandalwood trees are present but next to no Kauri Pines at all. Banyan trees, figs, etc. are absent and a few flowering trees carry a few MYZOMELA. LALAGE is present and a few ZOSTEROPS, but all bird life is scanty.

7 - ROVILIAU AREA

This area is a gently sloping rise to the southern mt. area, and is very fertile, volcanic soil over coral at considerable depth except where slight terraces appear. It is a silt washed from the hills and is most fertile. Rainfall is heavy probably 120 inches or more. Climate is humid on coast but cooler inland at foot of hills at about 1000' ASL.

Vegetation is very luxuriant, a short 40 ft. forest with a very, very dense underbrush and ground scrub of ferns, vines and much stinging plant and low tangled brown?, bastard cotton Rosewood trees and sandalwood are fairly common. Many fruit trees but not a great number of banyans are present, figs are common as are flowering trees and shrubs. There is much insect and mollusc life throughout the area. Bird life is prolific and most varieties appear in the area.

8 - IFWA TABLELANDS - Ifwa and Numaunorona areas

This area is a triple-terraced coralline plateau jutting out s.e. from the southern mts. and forming the complete southern part of the island. The top ridge is volcanic loam much eroded with few rocks appearing, the first, second and coastal are volcanic silt over coralline uplift each of these terraces being more or less flat and with coral outcrops showing at their margins where a steep cliff drops to the next terrace or sea. The soil is very fertile.

Rainfall is heavy, probably 100-120" per annum. Climate is steamy and tropical but apparently healthy as it is open to the prevailing trade winds.

A strange river formation has been formed in the top coralline terrace by a fork of the South River flowing around the topmost ridge or volcanic spur running off from the southern mts. Much of this river is a deep gorge especially in its lower part.

These 3 coralline uplift terraces are about 300 ft. each in sheer rise and the topmost volcanic ridge reaches about 1500', then rises into the 2000' southern range. Vegetation is very luxuriant, tall forest and short forest with dense underbrush ferns and stinging trees and much bastard cotton. A dense impenetrable scrub, unless knives are used and once one leaves the permanent

tracks progress is very slow. Fruit trees and flowering trees and shrubs are abundant as is insect and mollusc life, consequently all bird life is abundant. Banyan trees are common throughout all the coralline terraces but not in the topmost volcanic ridge. ??

Small Goat Island n.e. of Traitor's Head has a scanty scrub. I am told by natives a few ZOSTEROPS and MYIAGRA are present but mostly seabirds inhabit it. Several terns are said to nest there and an occasional Frigate bird is said to nest there??

NOTES Very rough and in haste but will give you some idea of trend of work.

## Erromanga

The area worked is principally a high coralline plateau 7-1000 ft. above sea level, mostly open grassland but has extensive patches of thin hardwood trees 20-30 ft. high with a smaller scrub, (a good deal of bracken fern in parts) intersected by many gullies or storm channels, most are full of a dense mimosa scrub 5-15 ft. high. 2 big river valleys cut into the area, being wide river valleys 1/4 to a mile wide with almost precipitous sides rising 7-1000 ft. but lower inland where a wide valley lies at ab ut 600 ft. ASL. beyond them rise hills to 2000 ft. or more, (not done yet). The two rivers are the Williams and Port Elizabeth. A very rough map is similar to below. A map of Erromanga shows Dillons Bay which will give you some idea of the general position of the section.

## All rough at Hap-hazard

### Halcyon Chloris

White unders except in one case has semi buff unders, several have golden flesh in wings generally a sign of sub adult I think. So far no definite Tannensis to be seen or shot. Natives say only one kind. N at difference.

2 samples (Tot 230 W99. Tl 66. BG 54 BC. 41 TR. 16 ♀
( W95. T 65. ♂

### Petroica multi feminina (Mayr)

Sent your description AMN 714 (1934) page 8, except juvenile more often no white frontal patch, adult female, small white frontal patch.

♀ TOT. 112, W 64, Tl. 43, Bg. 17. BC 9.5 Tr 18.5
♂ TOT. 118, W. 64, Tl. 45, Bg. 16.5 Bc 9. Tr 20.

### Cacomantis

Quite usual, very common. Parasites Petroica feminina, have young one which was being fed by Pet. when shot. Have I think definitely proved its parasites habit on Petroica. Rhipidura is not common here but Cacomantis is and so is Petroica.

♂ TOT. 225, W 130, TL 140, BG 31, BC 19, TR 23.
♀ TOT. 225, W 133, TL 130, BG 29, BC 22, WBN 10? TR 21.
Egg in oviduct
JUV. ♀♂TOT. 215, W 123, TL 105, BG 27, BC 15, WBN 8, TR 21. Different plumage

Rhipidura breuchlyi

Similar to Tanna. Not common (only 2 to date).
V.S. damaged. TOT. 157, W 73, TL 77, BG 15, BC 8, TR 19.
♂ damaged. TOT. 157, W 78, TL 90(?), BG 15.5, BC 7.5, TR ⊗

Zosterops flavifrons

♀ TOT 130, W 61, TL 46, BC 19, BC 12, TR 20 (typical Efate).
♀ TOT 119, W 59, TL 43, BG 17.5, BC 12, TR 19.5 (typical Efate).

Zosterops lateralis

♂ TOT 142, W 63, TL 51, BG 19, BC 20, TR 20.8 (typical Efate).

♂ 3/4 TOT 133, W 68, TL 52, BG 18, BC 13, TR 18 (like Tanna type - smaller).

Circus

Brown unders. same as Tanna. Very common by and wary as often shot at by grazier who claims damage to lambs by this species.

TOT 515, W 391, TL 225, BG 42, BC 32, TR 89, MTC 55.8.

Ducula pacifica

Very common at sea level and on plateau. Typical.

V.S. badly shot. TOT 395, BL 138, W 225, TL 143, BG 45, BC 25, TR 32.

Coracina

Common at seal level and on plateau.
♀ TOT 337, W 182, TL 162, BG 41, BC 24, TR 34
♂ SUBad. TOT 332, W 172, TL 150, BG 41, BC 24, TR 33.

Columba vitensis

Very common at all levels.
♀ TOT 435, W 226, TL 158, BG 85, BC 20.5, TR 32.

PACHYCEPHALA. pectoralis chlorura

Not common in this area; boys say common elsewhere in hills to the east.
♂ Subad. TOT 160, W 85, TL 67, BG 22, BC 14, TR 25.8.
♂ Full adult. TOT 165, W 89, TL 67, BG 23, BC 14, TR 25.

Ptilinopus Sruji

Not very common but fairly numerous. Quite ordinary.
♀ TOT 223, W 123, TL 77, BG 24.5, BC 12, TR 23.

Trichoglossus

Not very common but quite ordinary.

Myzomela

Not at all common - perhaps smaller than Tanna.

Lelage leucopygia

Quite ordinary and common on plateau.

Lechmira

Common around coconuts, rare elsewhere; consequently rare on plateau. Common Williams River valley. ♂ only caught so far in 5 skins.
♂ TOT 175, W 79, TL 70, BG 26, BC 20, TR 21.5. ) Big preponder-
♂ TOT 170, W 78, TL 67, BG 26, BC 21, TR 22. ) ance males

Myagra

Fairly common in all phases. Quite usual.

Ptilinopus tannensis

Typical of Tanna birds, possibly smaller. Found at sea level and on plateau. Fairly common all areas.
♀ 1/2 t. TOT 270, W 154, TL 77, BG 34.5, BC 20, TR 23.
♂ 1/4 TOT 279, W 152, tl 75, BG 33, BC 21, TR 23.

ERROMANGA (CONTINUED) BIRD NOTES

1 - DEMIGRETTA SACRA (nests) - Common all around the coastline and goes a long way up rivers, always as far as estuary fish are found, some 5-6 miles at times and even above that point to a certain degree, where it feeds on prawns.

2 - ANAS SUPERCILIOSA PELEWENSIS (nests) Not very common, but numbers appear on rivers and swamps at odd times. It nearly always present on the Cook's River but only small flocks appear to remain. It probably nests on the island but not to a great extent. No specimens taken by me but I saw a number on the wing and reports of odd small flocks at times were brought in by natives. I saw one badly knocked about specimen which a native had shot on a swamp in the Navola district on the grasslands plateau. Natives report having seen young with adults of this species on the Cook River.

3 - NYROCA AUSTRALIS (nests?) A few appear occasionally. I saw feathers of this bird shortly after it had been plucked. Natives say an odd one occasionally nests in the long grass in swamps. It is not as common as ANAS. I saw only one during my two visits to Erromanga, and that was on the wing over the Williams River well inland and was following the course of the river.

4 - CIRCUS APPROXIMANS WOLFI (nests) Is fairly common all over the grasslands area and I saw it at Cook River and in other parts of the island. Suffers a good deal from poison baits laid by the pastoralist in the grassland area. Nest on the ground.

5 - FALCO PEREGRINUS ERNESTI (nests) Is not very common but odd ones are found mostly along the sea cliffs where it plays on the wind currents and over river, gorges and canyons. I saw it in numerous places all over the island. Nests on the cliffs about Elizabeth Bay and probably elsewhere.

6 - HALIASTUR SPRENURUS JOHANNAE / sea eagle (white) (nests) A pair of large white sea eagles have nested at the extreme north of the island for several years previous to my visit and I saw them during my visit. They were extremely shy as they have been so often peppered by natives with guns that they keep well out of range. Being a strange and white bird they suffer like the white phase of DEMIGRETTA which as soon as it appears causes all natives to rush for their guns. I saw one specimen near Potnariven but it flew away north along the coast and was probably one of the same pair of birds. Natives also speak of them occasionally appearing in Ifwa. Bluffs area in the extreme south but only as casual visitors. Nests.

7 - HYPOTAENIDIA PHILIPPENSIS SWIND. (nests) Though I did not collect any specimens I saw a decomposed (slightly) specimen killed by a dog and it appeared identical with Tanna specimens It is not very common anywhere on the island but is generally distributed all over the island, probably commonest where native garden lands are most numerous. Odd ones are found throughout the bracken fern country and a few are found around swamps and in grasslands. There are numbers in the ferny underbrush of forest-lands. Water does not seem to control this species in any way as they are quite common in very dry areas.

8 - ?PORZANA CINEREA (nests)

9 - ?PORZANA TABUENSIS (nests) Though I did not collect a single specimen of either of these rails they are both present but very rare. (These or very similar) On several occasions I caught sight of different ones of these species and have no doubt I would have been able to collect specimens of both had I been on Erromanga during the months the grazer allows fires but during my times on Erromanga he was against my using fires in swamps in case they go out of hand and burnt his grassland. I tried dogs and snares but both yielded no results probably because the rails are

rare on the island. P.CINEREA seems to favour native gardenlands near water such as taro gardens and P.TABUENSIS favours the margins of reedy swamps. Both probably nest on the island.

10 - PORPHYRIO ALBUS ANEITY. (nests) Is fairly common in certain restricted areas but not anywhere really common as in some islands. Seems to favor certain valleys with streams in them and canegrass breaks along the margins. Had I been allowed to use fire I would have undoubtedly got more of them. They are constantly being chased by dogs but seem able to avoid them. Several attempts with dogs and native beaters failed to drive them out and the one specimen I got planted and froze and was caught by a native accidentally putting his foot on it and crushing it. At certain periods I believe this species has a long eclipse moult during which it is unable to fly and at such times it is very hard to flush or drive and resorts to dodging. It does a certain amount of damage to native gardens possibly because native gardens are its favorite haunts and not because of its numerical strength, taro especially, but it eats all native products, including sugar cane. It nests throughout the island. Is commonest in Williams River valley, north of South River and a small valley near the Soki River, behind Elizabeth Bay. Numbers are present in the Cook River area also. Odd ones are to be found all over the island.

11 - PTILINOPUS TANNENSIS (nests Is common all over the island, even on the grasslands where it frequents the scrubby gullies, from sea level to the mountain tops. Is controlled by the fruiting figs and banyan trees. Also eats guavos but I believe only after other birds have broken in to them. Eats the sticky pink gooseberry like fruit to a considerable extent, also vine berries. Favours scrubby gullies and forests if suitable food is present.

12 - PTILOPUS GREYI (nests) Common all over the island. Like P. TANNENSIS it favours scrubby valleys and forests where its food - banyan figs, berries, especially the sticky pale pink wild gooseberry tree berries and vine berries are found. From sea level to the mountains.

13 - DUCULA PACIFICA (nests) Common all over the island especially in the forest and mountains. Common in scrubby gullies in the grasslands even. Feeds on large figs and fruits, a large wild red plum (bitter) and a large red fruit with a heart shaped seed and also a large seeded yellow fruit seem to be its favourite fruits.

14 - COLUMBA VIT.LEOP. (Nests) Common all over the island especially on the grasslands. Does not seem to favor true forest very much and does not go abot 1500 ft. to a great extent though odd ones appear at the mountain tops. Seems to prefer the lower levels and more open types of country. Occasionally gathers in flocks of 20 or more.

15 - MACROPYGIA RUFA RUFA (nests) Is nowhere common on the island but is more numerous above 2000 ft. in the mountains. I saw only about 50 during my stays on the island and one one grey phase and heard of one other in the South River area and these two instances were the only cases any natives on the island had ever seen or knew of. A few are found in scrubby gullies on the grasslands but these are rare. A few appear near sea level in the Cook River area but elsewhere on the island they seldom come below 1000 ft. They feed principally on the berries of the penubre? tree. Nests in mountains.

16 - CHALCOPHAPS INDICA SANDWICHENSIS (nests) Fairly common all over the island except the extreme mountain tops. Feeds on ground and feed much on seeds of acacia (Mori) tree, I believe.

17 - TRICHOGDOSSUS ORNA. MASS. (nests) Is not very common but is fairly numerous. I have seen a flight of these birds at sea midway between Tanna and Erromanga at the end of Feb. 1937. Like elsewhere is noisy, feeds on fruit and seeds and flowers and berries to a slight degree. Seems more common in Ifwa area than elsewhere. Moves rapidly from area to area and probably mobs cover the whole island, giving an impression of being more numerous than they really are.

18 - CHARMOSYNOPUS ?PALARUM PAL. I did not see a single one of these but from descriptions by a reliable bush native I believe this bird occasionally appears above 2000' ASL in the southern mountains especially when the sago palm is in flower. It may visit here from Futuna (see some species notes from Aneityum).

19 - CHALCITES LUCIDUS LAYARDI ? I saw no specimens of this bird but it is evidently present at certain season as natives know it and a white person described it to me and showed me feathers of it. I also saw its feathers in the hat of a native in Cook River area. He said sometimes there were plenty and sometimes none at all. Evidently a migrant. GERYGONE is absent from the island as it is from Aniwa Island yet CHALCITES appears on both islands at certain times. I also have actually seen it on Futuna Island in Feb. and March. Whether it is LUCIDUS LAYARDI or some other remains to be proven as unfortunately I did not collect a single specimen.

20 - CACOMANTIS (nests) Common all over the island but especially so on the grasslands plateau where PETROICA is common, as this species seems to be its main foster parent on the island. Also along river valleys where RHIPIDURA is common. I believe it also parasites MYIAGRA, but have no definite proof of this. LALAGE

I know it occasionally parasitizes. Not as commin in mountains near their tops, but is fairly numerous even there. Calls much at night. Suffers a good deal from hawks.

21 - URODYNAMIS TAITENSIS (nests) Very common in the Cook's Bay district and along the east coast at certain seasons. A few appear on the west coast. I saw several instances of its having been killed by hawks. Natives say it catches and kills snakes (see note on Futuna this species also) by allowing snake to throw coils on it then it strikes out their eyes. I have seen blinded snakes, large 8 and 9 footers on Malekula and Santo. It probably does attack smaller snakes as it eats lizards. What it parasitizes I do not know but as juveniles appear at times I have no doubt it does breed occasionally if not commonly.

22 - TYTO ALBA LULU (breeds) At certain seasons it is said to be common but during my two stays of 3 months on the island it was conspicuous by its absence. I only heard one, half a dozen times and never saw one, though one was shot only a week prior to my second arrival. During both my stays there I had native shooters constantly out after them and several times had 20 boys for several days on end after them but did not get a specimen, nor sight one. Natives persecute them as they fear them say they have devils in them and bring sickness. By the feathers of the dead one I saw, they appeared darker than the northern New Hebrides race.

23 - COLLOCALIA ESCULENTA UROPYGIALIS (nests) Common all over the island. Hawks mostly low down in amongst trees or between patches of open scrub in the grasslands along roads and tracks and rivers, etc. Nests in shallow caves, amongs banyan roots, etc. in small colonies. This is the species which flies generally nearest the ground. Is common in the mountains also but

not as common as in more open types of forest and scrub. Does not hunt much in absolutely open grassland but occasionally is seen a fair distance from trees or scrub in dull weather.

24 - COLLOCALIA SPODIOPYGIA LEUCOPYGIA (nests) Common over most of the island but favors more open types of country and in forests hunts over the tree top level. Generally speaking it hawks at higher levels than C. ESCULENTA and does not approach so near the ground nor does it hunt under and between trees but in open types of scrub and grasslands. It travels and hunts across the absolutely clear grasslands at great distance from trees and in this type of country approaches near the ground, but if a clump of scrub intervenes it invariably rises over it whereas C.ESCULENTA goes through it. Seems to be semi-migratory or migratory as it disappears at times. Probably nest in caves in cliffs along the coast but I found no colones or nests. It is certainly very numerous along the cliff tops and the cliff faces. N.B. (SEE LATER NOTES OF MARE ISLAND. I DID NOT LOOK IN DARK ENOUGH CAVES AND MISTOOK POSSIBLE BIRD GUANO FOR BAT GUANO IN THE DARKER CAVES.) Does not appear to hawk much around rivers and water but favors drier localities, in fact its degree of commonness seems to go in inverse ratio to the rainfall of the island in the different localities. I at one time thought there were two species of this bird present but I don't think this is likely.

25 - COLLOCALIA VAN. VANIKORENSIS (nests) Common in the grasslands and more open types of country but rare elsewhere. It hawks most at heights above the other two species of COLLOCALIA and favors the very open grasslands. Does hunt to a certain extent over water but generally speaking hunts high over grassland and open savannah and scrub lands. Much of its time it hunts above gun range and it is only certain weather conditions which

bring its food down that makes it drop to lower levels at such times all 3 COLLOCALIA hunt at the lower levels intermingling to a certain degree but in normal weather one finds them hunting at 3 separate levels. C.ESCULENTA along ground and in scrub, C.SPODIOPYGIA just over tree tops and grasslands and C VANIKORENSIS high over grasslands and open scrub. Probably nests in cliffs but from odd unidentified nests I found in banyan roots and places I believe this species nests singly in such situations and is not a colonial nester.

26 - HIRUNDO SUBFUSCA TAHITICA (nests) Is common in certain localities and along rivers, etc. where it hunts much. Also hunts much in very open grasslands miles from trees where it plays much on updraft and wind currents and also about gorges and cliffs. Nests in hollow tree sprouts? and under limbs, etc. and occasionally in dwellings and much in caves of cliffs along coast, etc.

27 - HALCYON CHLORIS JULIAE (nests) Common all over the island in all types of country and at all levels except in the rather barren sterile soil areas where it is not so common.

28 - LALAGE LEUCOPYGIA SIMILIMA (nests) Common in all areas especially in grassland scrub areas, not so common in forest but still numerous and a few are found in the sterile areas. Goes right from sea level to mountain tops.

29 - CORACINA CALEPONICA THIEL. (nests) Especially common in grassland plateau areas, fairly numerous in forest and in all but the steril soil areas. Feeds on beetles principally. Nests along rivers and in hardwood.

30 - TURDUS POLIOCEPHALUS ALBIFRONS (nests) Common in most forest areas where underbrush is common. Does not come down to the coast anywhere along the w. or s. or se. coasts but does in the Cook River-Port Nariven area to a slight extent. Is common on all

mountains above 2000' or 1500' ASL. Seems to be controlled a good deal by the distribution of molluscs. Is wild and shy but can be collected with some care and a bit of difficulty. Nests throughout its habitat. Has alarm call like all its family and a zizz-zizz call also. Can be heard tapping the snails and makes collections of shells in notches in horizontal branches, limbs, etc. Generally speaking it is a mountain bird found from 1000' or 1500' upwards though numbers are found in the low saddle between the two mountain massifs where suitable forest is found. Though all of the Ifwa area is suitable forest the bird is rare in this part. They occasionally seem to form in large parties for meetings, possibly to mate, as 20 or 30 may very occasionally be found together but scatter in alarm very quickly. Generally in pairs or family parties. They have a tendency to pick up bright objects as I found a nest of one decorated with a piece of silver paper no doubt collected from my camp, and natives have told me the silver ring on a pipe attracts them. They certainly make shell collections but I think this is accidentally more than by design as they favor certain suitable rocks and roots for tapping the snails. They generally do not break the shell, or only make a small hole, but appear to tap the animal cleverly and daze him out far enough to get a good grip of him.

31 - RHIPIDURA FLABELLIFERA BRENCHLEYI (nests) Common in scrubby gullies, river valleys and forests at all levels from sea level to the mountain tops. Is bold and friendly and can easily be attracted. Does a considerable amount of wandering at non-breeding seasons. Is a pugnacious little fellow when nesting.

32 - MYIAGRA CAL.MUL. (nests) Common on all the lower levels on the island in the hardwood and mimosa scrubs and some distance up the mountains but not common above 2000' or for that matter much above 1500'. Across the saddle of the centre and Ifwa Bluff

it is common but not in the true mountains. Along coast and coastal cliffs it is very common.

33 - PETROICA MULTICOLOR FEMINA (nests) Exceedingly common in mimosa scrubs, in scrubby gullies of grasslands plateau and in hardwood scrubs. Averages a nesting pair every 30 or 40 yds. in this area. Is very common in all forest lands below about 1500' but is rare above that altitude. Is in pairs or small family parties and seems definitely confined to small areas for feeding, etc. but can be lured across these boundaries, but is immediately chased by other pair in occupation. Seems to thrive in mimosa scrub. Has a habit of perching sidewise in these scrubs to a great extent, possibly because of lack of side branches and twigs in this type of scrub, which grow in bare poles. It is not very shy, is easily lured especially female and juveniles, but males have a habit of attacking and driving them away from observer. Adult males almost always perch at greatest distance from observer. Nests are well disguised with lichens, etc. in an upright fork on a flat limb or in a large fork against the main trunk of the tree. Seldom above 10 ft. and generally 4, 5 or 6 ft. from ground.

A few found in isolated clumps in grassland and in scanty scrubs of central saddle but generally speaking they prefer low dense or hardwood scrub. Occasionally congregate in small parties of 10-15 but never for more than a few minutes when they again split up. Do not wander far from their nest area at any time.

34 - PACHYCEPHALA PEC.CHLOR. (nests) Is common in scrubs, on the steep cliffs of the n.w., s.w. and s. coasts and penetrates up the scrubby gullies from these across the grasslands but strangely is not common in the larger valley of the Williams River though it is common in the Johnstone and South River valleys.

Is common throughout all the forest area except the Cook River, Potnariven, Traitor's Head area where it is rare or absent. (These are volcanic areas similar to Tanna, it is absent on Tanna, some special food deficiency?) Appears to be brighter at higher levels, 2000' ft. and over but there is no definite line of difference. Ones at that height and from sea level being intermingled so that they cannot be picked out in one day specimens. Thus 1-6 are from sea level; 7-12 from 2000' or over and ranging from duller to brighter run say, 1, 2, 7, 8, 3, 4, 9, 10, 5, 6, 11, 12. I think females do show a tendency to brighter unders, immature males are the same, adult males are the same. It is a little shy but can be lured and observed with care. Inhabits mostly the treetops and middle scrub, but descends to near ground a good deal and feeds in low scrubs, mimosa, etc. to a fair extent. Generally speaking it feeds from 15-40 ft. and higher. Calls much usual Pachy, calls and will answer mocking calls. Females are generally silent or have a small chip, chip call or end the whistle of the male with a loud witchu. These birds wander considerably when it is not the mating or nesting season.

35 - CLYTORHYNCHUS PACH. GRIS (nests) Does not come down to the coast anywhere on the n., w., and s.w. sides of the island but like the TURDUS is more a mountain bird though all along the east coast it is common right to the sea margin and it is also very common in the low central saddle at places where suitable forests are found. It is found in the Ifwa Bluffs area and is common there though not near the coast on the s.w. side. Is definitely a forest dweller where it inhabits the lower scrubs and secondary trees principally from 5-25 ft. but often lower and occasionally higher. Common in small flocks of half a dozen or more or in family parties and occasionally in pairs. Males

greatly outnumber femaies. Is shy but curous and will speedily return after being startled. Is easily called and gains confidence if observer does not move.

Is very common in the higher levels above 2000' in the southern mountains but is not very common in the northern mts. except in one or two limited areas.

36 - LICHMERA FLAV. FLAV. (nests) Common anywhere where coconuts are except on the east coast where it is not quite so common. This bird is almost entirely controlled by coconuts and if one is heard in forest land coconuts are sure to be found at hand. Appears larger and brighter above 1500' though not so common there. Also frequents orange trees in fruit where it appears to be atrracted by insects which come to punctured and fallen fruit, and I believe it probably has some value in combating the puncturers (fly and moth). Will eat or drink at an orange opened by ZOSTEROPS. When shot invariably vomits and honey can be found in bill and feathers though not visible in stomach, it can be tasted. This seems to be a characteristic of ali honey eaters. Natives call it the bird that cleans the coconuts and I believe it does to a great extent help keep trees healthy, especially of smaller insect pests. Eats ants; males greatly outnumber femaies. It is safe to say it is never far from coconuts.

37 - MYZOMELA CARD. CARD. (nests) Not particularly common except in certain small areas but a few are scattered all over the island. Is common in the flowering shrubs of the sterile soii areas and in certain flowering tree and shrub areas of the mts. - above 2000' ASL where the red or purple flowering Royal Flower Tree of Tonga is found. Is pugnacious and attacks all birds. One would expect it to move about with the flowering

trees, but I believe this is not so, and it definitely inhabits a small territory and when flowers are not available lives on ants and insects and bees occasionally. Will eat the common house fly also. Like LICHMERA it vomits on being shot, also inhabits oranges in fruit like LICHMERA and eats the same things. Unlike LICHMERA it is found far from coconuts. LICHMERA drives it away from coconuts and it will drive LICHMERA from its nest vicinity but they do not overlap to any great extent. In a house garden at the Grayar's I witnessed many battles between one nesting there in oranges on one side of the house where no coconuts and LICHMERA which inhabited coconuts on the other side of the house. MYZOMELA occasionally visited the coconuts but was invariably hunted and made little attempt to fight but if LICHMERA crossed the garden it became a raging little fury and invariably drove LICHMERA away. I place LICHMERA as a definite bird of territory both here and on Tanna and it will drive or attack anything in that territory, but is spiritless outside its little area

38 - ZOSTEROPS LAT. VATENSIS (nests) Common all over the open grassland plateau and in the more open types of scrub. Does not frequent forests except where clearings occur, native gardens, etc. A few visit the forest at times where they feed in the tree-tops. Often found in company with Z. FLAV. Goes in small flocks of half a dozen up to great numbers at certain seasons. When young are being weaned great flocks congregate and drive the young away and a great calling and chatter goes on. Z. LAT is not nearly as common as Z. FLAV. The ratio probably being 20-1 but in suitable areas it is not uncommon.

39 - ZOSTEROPS FLAV.? (nests) Very, very common in scrubby gullies and forests at all levels from seal level to mt. tops and is very numerous even in the open grasslands. Easily the commonest

bird on the island. It also congregates in large flocks to drive the young away, generally in small flocks of 4 to a dozen and is very active. Feeds in grass and on ground to a large extent and on fruits and insects.

40 - ERYTHRURA TRICH. CYAN (nests) Not very common anywhere on island. Mr. Grayar said it was once very common about his house but was now rare. I believe it was principally because of his constant burning and heavy stocking of the area which prevented grass from seeding and so destroying their food. I told him this during my first visit and during my second they were more common as he had not burned or heavily stocked the area near home. They go in small flocks and family parties of 4 or 5 and undoubtedly travel over much country. At certain seasons they retire to the hills to feed on tossel trees and small seeding shrubs. They nest in holes in coral stones along the cliff faces and elsewhere where rocks with cavities are found. I found one nest in a hole in the face of a cutting on the main road to the sea where traffic was pretty regular and constant. They have wonderful eyesight and are shy and have to be shot at at long ranges or on the wing flying unexpectedly past one. I was fortunate to get a small series during my second visit. Occasional ones and parties are met with all over the island except the extreme mt. tops but they are not very common on the island. The grasslands, hardwood scrub and cliff edges and faces being the only places they are found in fair numbers, but even these places only once or twice a week would one see one except at nesting time, I imagine.

41 - PTERODROMA LEUCOPTERA BREVIPES (nests Nests in the loose volcanic soil of the southern mts. and also in the northern mts. but not to a great extent. A tremendous colony nests in the peaks of Traitor's Head. Many can be heard calling, passing overhead about 8 P.M. and the hills are simply riddled with burrows.

I believe all other species found in the area nest here also. Numbers in the southern mts., a few in the n. and many at Traitor's Head. The following species, though I have no proof, I think will be found to nest far up in the hills.

42 - PUFFINUS LHERMINIERI NUGAX (nests?) Seen at seas off Erromanga.

43 - FREGETTA ALBIGULARIS (nests?) seen at sea off Traitor's Head and elsewhere.

44 - PUFFINUS PACIFICUS (nests) or a very closely related form. Nests on the cliffs tops of the s.w. coast I know, and several numerous colonies are present and fortunately not known to the very few natives of the Ifwa Bluffs area. Round about Cook River the hills and peaks also have a few small colonies. Traitor's Head possibly has this species also and there may be a colony on Goat Island?

45 - ANOUS STOLIDUS
46 - ANOUS MINUTUS
47 - STERNA BERGIL
48 - STERNA ANAETHETA
49 - STERNA SUMAT. SUMAT. (nests)
50 - SULA ?

45-50 All seen by me near, or at sea off Erromanga. One or more may nest on Goat Island or about the cliffs of the mainland but it is rarely, I think.

51 - FREGATA ARIEL
52 - " MINOR

Both appear and some are always present about the island and at hurricane times, natives say odd ones were known to nest on Traitor's Head and Goat Is., but this is doubtful.

53 - PLUVIALIS DOM. Common on grasslands and seashore.

54 - TRINGA BREVIPES Common along coast at cliff floot and elsewhere.

55 - ARENARIA INTERPRES Common at times and always a few about except in migration? months.

56 - LIMOSA LAPP. BAUERI Small flocks occasionally appear, generally found with the next species or with PLUVIALIS or with TRINGA.

57 - NUMENIUS PHAEOPUS - Small flocks common around the reef tops.

Aneityum & Futuna

Please forward c/o H. Brock
Agent en Douane
Noumea, N. C.
4/9/37

Dear Mayr,

There is a possible chance of a cross mail via Panama on a Messageries boat so am taking this chance to answer 2 letters of yours, which I will do after dealing with other matters in their order and giving you a rough outline of my past movements and work. Am at present on my way to the Loyalties but with bad connections etc. may not be actually at work there till about 3 weeks time. I am due in Vila tomorrow and by bad luck have missed the boat out of there to the Loyalties by some days.

Firstly the consignment of skins which you should have received long before you get this note has had a most eventful time. I despatched these from Tanna by a steamer at the end of May or early in June. The ship was wrecked on the south of Efate the day before arriving in Vila. The manager of Burns Philp & Co., Vila, to whom they were consigned for forwarding got them a week later but as they appeared to have been wet, held them in Vila for 5 weeks, then sent them down here again for me to examine in case they had been damaged. The damn fool might have realized the 5 weeks in Vila was enough to finish them if they had been damaged. Anyway I was not on Tanna, but on Aneityum and did not see the steamer. Fortunately friends on Tanna despatched the skins back again P. D. Q. and on hearing of it I got a chance by a visiting man of war to write him a note to urgently forward them at once as any damage done was then too late to be rectified by me and the sooner you had them the better chance of repairing them if they needed doing. I wrote him to advise you about their being shipwrecked so you could open them immediately on arrival. You would have had these skins by this date if he had used his head and forwarded them immediately he received them and all damage might have been rectified in time. To avoid any further mistakes I told him I had examined them and they were O. K. Actually I wasn't within miles of them but if he thought that was the case might do some other damn foolish thing. Anyway I sincerely hope you have them long before you receive this. By the way the Aneityum skins I got will be going forward about this date. They will only be a small lot and you should receive them within a few weeks of this.

After sending those skins off the first time I was weather bound in Tanna till beginning of July, then I got away with the chaps launch I wrote you about & he intended stopping 3 days on Futuna then 5 on Aneityum & later returning there to pick me up to catch the steamer on Tanna. We were 14 days weather bound on Futuna, he then ran me to Aneityum & landed me & left himself for he was wrecked the same night but of course I knew nothing about it & was left stranded on Aneityum till a week ago. I was really getting desperate & had just made all plans to try the 45 mile crossing to Tanna in a canoe but the weather didn't give me much of a chance. I was

determined not to miss this steamer as it was my only chance of reaching New Caledonia till possibly Dec. as owing to the French boat being wrecked and B. P.'s boat having to go to Suva for docking I would have had to go to Noumea via Sydney, a big waste of time & money. Anyway I got here. On arrival on Tanna I received your accumulated letters & the little book on the Loyalty birds of which more anon.

First the work: On Futuna I found myself much handicapped by having to be packed up ready to leave at a moment's notice for 10 days but managed to get a number of skins, a Tyto, a Turdus & 5 C Charmosynopsis being the most important. I managed to run over the birds fairly well & you will be able to get a fair picture of the bird life there when the field book goes forward. Roughly I found only 1 Zosterops same as Tanna flavifrons apparently. All the following appeared the same as Tanna. Myagra, Myzomela, Rhipidura, Collocalia esculenta (the only 1 present which I saw during my stay; others may visit but I don't think they nest). Turdus, Tyto, Eudynamis, very very common but of 5 specimens shot not one was in good enough condition to skin as they were in heavy moult). Cacomantis is rare & has only arrived on the island within the last year, natives call it a new bird & have no name for it. Charmosynopsis, is very common & is the only parrot present. Some species of Petrels nest but I did not get any. Demigretta is common, all blues seen by me, whites very very rare if ever present. Terns are fairly common at times I believe. Circus is fairly common at times as is Falco. Both nest in very small numbers. Porphyrio is present but rare. No rails appear to be present. Erythrura is entirely absent. Halcyon is present but not very common, appears to be ordinary Julia. Ptilopus Greyi, present & fairly common, same as Tanna. Ducula pacifica is common, & same as Tanna. Columba vitiensis leopoldi common & as on Tanna. Macropygia ditto. Chalcophaps. Petroica absent.

On Aneityum. Accipiter is present & common but hard to collect. I got 2, a ♂ ad & ♀ juv. both in good condition. I believe this bird is never on Tanna as in the old days a valuable trade existed between the islands in the feathers of this bird as they were highly valued on Tanna for dancing head dresses & native ceremonies. Tyto is present & common. Only 1 Zosterops is present. Collocalia esculenta and leucopygia & possibly vanitorensis. Chyzomela, Myagra & Rhipidura common & as on Tanna. Halcyon is not common but appears to be typical Julia. Porphyrio is present & fairly common. I got 2 skins, 1 in very poor condition. Hytopaenidia is present, as is a taubensis one of which I got. Erythrura is very rare or was during my visit. I only saw one bird far up in the hills but these will be got for you as I explain later. Trichoglossus visits the island but is rare & probably never nests. Pachycephala is common but the

males outnumber ♀ and juv. ♂ by more than 10 to 1. I managed to get quite a fair series of ♀ ad but only one ♂ sub ad. which was in the transition plumage. Petroica is very common and I got a fair series and in every case except one I am absolutely positive of the sex. It appears to be like the Tanna bird superficially. I dried most of these skins with the white shoulder patch rather exaggerated as I drew it slightly into prominence and kept the scapulars rather back. Possibly in transit they will shake to normal. My reason for doing so was that in drying I noticed a tendency for this to become hidden and in life it is fairly conspicuous. I found no Turdus on the island (except what I believe to be a stray from Australia, either an imported thrush, English Turdus melanura or one of the Aust. ground species, probably the latter from somewhere on the Queensland coast). Circus and Falco are present. Natives speak of a small gray hawk (smaller than Accipiter) which is very fierce, kills large pigeons bigger than itself, but only hunts in the forests below the tree tops, is a very fast flier. They have a name for it, and all seem to know it but I failed to find one and one day put 12 guns out after it and covered immense area but not one was seen. I covered in all about 3/4 of the island or more; the only place I did not go was the Image river valley. I was commencing this when the Govt. agent arrived in his launch and took me across to Tanna. Numerous sea birds and shore birds are present. Demigretta being common, all blues. Eudynamis is present. I saw feathers of one caught by a wild cat. Charmosynopus occasionally appears but doesn't nest. At least one petrel nests and probably more.

I took a sample of most of the birds present exclusive of pigeons (Chalcophaps, Ducula pac., Columba vit., Ptil. greyi all having been seen by me) but left a few gaps. I have taught Mr. Freeman, a resident of the island, to skin and he is carrying on and completing the island. Mr. Freeman is the man mentioned in your paper on Petroica as having sent spirit specimens of Aneityum Petroica to Mr. Kinnear of the British Museum. I have roped him in on your behalf. I have left him all the cartridges and cotton and labels I had left over, my skinning tools, poison etc. and my dryer. He made a number of skins under my eye, I have included these in the present consignment and put his name on the labels so you can see the type of skins he makes and advise him accordingly. He is very painstaking, is interested in the work and will I think make a success of it. He has his own plantation to look after but will have intervals when he can get in some bird work. I have left him the sum of $25.00 to meet any out of pocket expenses he may incur and this should last him some little time and I have told him that if the material he forwards is satisfactory you will reimburse him for any out of pocket expenses he may incur providing they are reasonable. Knowing him as I do I know these will not be

large. For years he has been having the devil of a job to raise chickens because of Accipiter and has shot as many as four in one week, in future these won't be wasted and you should have ample material of this hawk by the time he finished. Unfortunately it not chicken time when I was there or I might have got more than 2 of them but I doubt it as I was a good deal of the time away in the bush too far off to have birds brought to me. I have left a a rough list of instructions for him as to what to concentrate on collecting, first the finch and then Accipiter, then sub ad ♂ Pachy, Petroica, etc. You can write him direct and make suggestions etc. as material comes to light at your end. I have particularly instructed him to watch for migrants, sea bird and petrels.

Mr. Freeman was born on Aneityum and has only been away for a couple of years schooling and does not write fluently or spell well and is rather nervous about writing to you. I have advised him that if you can decipher my rotten writing and spelling you will have no difficulty with his. He can read all right and has self taught himself, manages to get along. You could put him at his ease with a friendly note and from personal experience I know you will be lenient with his first efforts and not discourage him too much as he is inclined to be nervous and suffer from an interiority complex. He is a grand chap and very conscientious and I feel sure he will make a success of it and has promised to do his best and knowing him as I do I feel sure that will be a good standard. He is slow and very painstaking but as he will be there for years he will prove an invaluable asset and a really wonderful picture of this extreme island of the group should result; especially in migrants his observation should be valuable. He is naturally observant and has always been interested in nature. He seemed a bit inclined to think he should do it for the B. M. but I showed him that in science there are no national boundaries and that the material would be far better in the AMNH which has already a much fuller collection of New Heb. skins than the B. M. and so have weaned him from that idea. I think the experiment will be a great success but time will show that. I will keep in touch with him from the Loyalties as I am closer till you can communicate with him and put him at his ease. Mr. H. Freeman, Aneityum, N. H. will find him. He will forward skins through B. P. Vila as I have been doing. Being a local resident speaking the language and being a good bushman he will be able to get a fine series and a really complete picture of the bird life of Aneityum should result.

Our being so far apart causes us to be rather at cross purposes etc. and we always seem to be ages behind. My letter to you re plans for a field book had already gone when I got yours re not worrying about measurements etc. and other things and now your reply has come back. In the meantime I had decided to use another form

of field book and leave out all the measurements. I will keep a duplicate carbon book with the daily notes and notes on individual birds, the original will go forward to you with every consignment of skins or by mail and a carbon copy remain with me till the island is finished etc. and will forward the carbon copy with it in case the previous one has not arrived safely. I have scrapped the form of notes I used before and have been busy on notes along your lines and will forward these in a few weeks from now. It certainly makes things a lot easier.

Now to deal with your letters in order. Firstly yours of May 3rd.

I believe you will find my Aneityum skins of even better quality than the Erromanga skins you received. I am now getting into things a lot better and speed is improving slightly. Strange to say I generally find a thing out for myself about a week before your letter with a tip about something arrives but the drawing out of the scapulars was new to me and makes a vast difference to the appearance of a skin. I still have some bother with the rump feathers, and would be obliged if you would let me have a single non valuable perfect skin again so I can get the proper hang of the placing of the feathers. A pachycephala would perhaps be best. A single skin posted to me would be sufficient. I may pull it to pieces but will probably return it. The amount of bone cut away in the head is what I want to know. I have not yet managed to grasp the idea of holding the skin as you direct, i.e. between thumb and 1st and 2nd finger but this may come in time. I manage fairly well in my own way but it is probably wrong and slower than the correct way. It was certainly a good lesson to me on the value of the better quality skins when you wrote me that the new Erromanga skins of Petroica showed you that they were probably a new race, also the Pachycephala.

Many thanks for the book on Loyalty birds. This I will write about under separate cover, as you say it has raised a number of questions in my mind.

My letter to you was left open and posted by a chap in Sydney who promised to put Sullivan's address in it. This he forgot to do; since then I think I have already given you his address but in case I haven't am enclosing his letter head. If it is not too expensive I will radio you my address in New Caledonia.

I note what you say re the plaster of paris tending to alter the hue of birds and will bear the point in mind. Anyway I have been using corn flour alone lately.

I have received the consignment note, bills of lading etc. for the guns and these will be forwarded to Noumea as soon as they arrive

in Sydney. I note you have included tools. These will be very acceptable as they will probably be much better quality than those which I have got in Australia, this will give me a duplicate set in case I lose some of them and the scissors etc. I got in Aust. all told only amounted to a few dollars.

In naming any new birds in the southern New Hebrides (if it is not already too late) I would like you to name one after yourself, then one after the A.M.N.H. or some prominent authority (president, or such), then one after Tom Harrisson. I would like you to do the same and in the same order in the Loyalty material. You know my ideas about naming after persons and do not want any named after myself, but I do think your untiring efforts and patience with my poor material should be recognized. Also if it had not been for you the work would not have been done and that also is the reason why I would like some form of recognition for the AMNH which has so faithfully stood behind me in my work and this has been a great help to me in my work. Tom Harrisson I would like to recognize for having introduced me to you and so made the work possible.

Re the Bank of N.S.W. I have already established touch with them and also the Bank of Indo Chine in Noumea. Owing to being cut off as I explained above I was all behind with the mails etc.

I suggest you send 100 dollars per month to the Bank of Indo Chine in Noumea for 5 months and by then I should have some idea of the rate of spending and can advise you accordingly. I doubt I need any more funds in Sydney as all goods from there are already in Noumea and further supplies can be bought from Sullivan's agent in Francs in Noumea. I may send a radio to this effect in a few days not because of a shortage of funds but to avoid any unforeseen circumstances which may occur.

Re the New Guinea trip there is ample time to discuss this after the Loyalties. One thing if I went with Harrisson I would demand independence re work and system as I would not be satisfied to have to rush the work and sacrifice the quality of my skins to the god of speed. I am ashamed ot the skins I put into the B.M. when with T.H.H. and of the first lot I sent you which were of the same quality. Anyway by then I should be pretty well able to keep the quality and have the speed. Mind you any errors you see in skins I want you to point out to me, or any suggestions for improvement, as I know I have a long way to go for perfection yet. Anyway the matter of N.G. can come up later.

Trusting this will catch the mail across, I will close and write again in a day or two.

I remain,

Yours sincerely,

Macmillan.

forwarding address as I will be moving about the group after birds.

c/o Manager
Burns Philp (South Sea) Co.
Vila
New Hebrides
5/4/35

Dr. E. Mayr
Ornithology Dept.
American Museum of Natural History
New York

Dear Sir,

We have to acknowledge receipt of your radio re support for the expedition to the southern New Hebrides for which many thanks.

We consider it would be advisable to start there about August when the main breeding season will be beginning, also the migratory & semi migratory birds will be starting to pass through.

Would be pleased to have copies of all bird data etc. on the Whitney Exp. as your work & Murphy's on them are invaluable.

Harrison & self are awaiting your following letter in which we expect to receive your suggestions & any detailed instructions. As I am working in part directly for you, any directions or suggestions you may make will be carried out by me to the best of my ability.

I remain,
Yours faithfully,
L. Macmillan

Tanna
New Hebrides
31/10/35

Dear Mr. Mayr:

Many thanks for radioing across that £10 I wired for. Harrisson left here by the Caroline and left me with £10 Aust. to get to Tanna and carry on. Owing to a mix-up of launches I couldn't get my gear up to catch the first chance of a steamer to Tanna as I had planned so had to let it go. The next chance 2 weeks later I took but the steamer sprang a leak and had to be beached, so yours truly was wrecked. If Harrisson is still in the states you might let him know as he will be very interested to hear that the "Makambo" is wrecked. I got to Nila and having to wait there for so long ran away with the cash so not knowing Harrisson's whereabouts I radioed you. Will return that £20 when Harrisson forwards the other cash to me or if you consider it worth carrying on down here will use it to prolong the stay but that rests with you.

I have been a month on the job and nearly 2 weeks laid up with a poisoned leg contracted getting down a bushy cliff after shearwaters which were nesting on an almost inaccessible ledge. Was lucky not to break a few bones on that trip. Am now getting about again and am going off inland directly after the steamer. I have done what I class as the pure volcanic area of Tanna, i.e. bare and plain, low scrub, cane grass and pandamus, semi bush and garden lands. Am enclosing a rough map of Tanna to give you an idea of the layout and what I have done. Now I am here from what I can see of this island it will take me at least 4 months to cover all the island properly, i.e. another 10 weeks and that of course does not touch any other island. Down here it is hard to get about as launches are few and far between and the steamers only call at certain islands occasionally (Futuna and Anuva). Do you think it worth while going to further expense to do the islands absolutely thoroughly. I am not a fast skinner and I am a very slow but thorough worker and hate half doing things. Others might have done what I have done in 4 weeks in 2 but would probably have missed some things, the petrels almost certainly, as Buxton and Humphries both did this area and missed them and they were Buxton 1 momth, and Humphries 3 months in this area. There are not many of them left there now.

If you think it worthwhile carrying on after you have read through my notes of what I have dug up in this area, which is comparatively a small piece and has a vegetation of its own and is unlike other parts of the island you could let me know by wire. The actual cash part I think would be covered by the £20 you wired plus the £40 Aust. Harrisson has still to forward to me if you forwarded the following at the time you radioed me that you wished me to keep going so I would receive them about March next year or even earlier.

<u>500 round 16 G. cartridges as follows</u>:

| | |
|---|---|
| 250 rounds No. 10 shot. )<br>100 rounds No. 8 shot. )<br>125 rounds No. 6 shot. )<br>25 rounds No. 4 shot. ) | 500 rounds 16G.<br>smokeless cartridges |
| 150 rounds No. 6 shot )<br>100 rounds No. 8 shot ) | 250 rounds 12G<br>smokeless cartridges |
| 250 rounds No. 10 shot | 410G smokeless<br>cartridges 2-1/2 inch |
| 1 colour card | |

Plenty of cotton wool, 1 dozen or 2 dozen rolls

Skin and spirit labels (have Aust. Museum at present).

If you thought it worthwhile, the cartridges and wool and colour card could be sent from Australia on a wire from you. Burns Philp could act as agents or better still a chap called C. Sullivan, Island agent, Kent Street, Stdney, Australia, or Herr Bros., 139 Clarence Street, Sydney (cable address Care, Sydney), the 2 latter only charge 2-1/2% whereas B.P.'s might charge 15%. Our duty down here on cartridges is 100% but if you wrote to the British Commissioner as I will, he might let them in free, but I doubt it, although they will not be for sale. If you should do this, stipulate and stress smokeless powder, otherwise they will send black powder as it is cheaper and the usual for down here (for trade purposes being cheaper and consequently less duty) but they haven't the killing power of smokeless. Still if you send them from the states immediately on receipt of this, they will be here in time if they arrive by next February as I have ammunition, etc. to last till then. Down here we can only but No. 4 shot which is too heave. I had to get my last lot from Australia and got 1000 rounds mixed as above direct from Imperial Chemicals. Anyway the whole matter rests with you. But if you want me to carry on, send a radio Macmillan, Tanna, New Hebrides "Advance" and I will take it you want me to carry on. Personally I think

Erromanga is very important and will do it in any case. Aneytuim is the next most important or possibly as important but it will mean a full six weeks to do that as the steamer is the only means of coming and going. Its main importance being a meeting ground of 2 areas, i.e. New Caledonia and New Hebrides. Erromanga is important for the same reason, being the meeting of southern and northern New Hebrides.

I note what you have pointed out in your letters. The Myagra is rather more complicated than a bill measurement difference I am afraid. At present it has me rather puzzled but hope to unravel it. At present it looks rather as if there were 2 distinct types.

Pachycephala I have not yet seen one of but I didn't expect them in this type of bush. Next week I expect to find them inland.

The Halcyons are most confusing but I think there are 2 sub species. Anyway I intend taking a full series of 50 skins and have a dozen already, so you can sort them up without difficulty.

In my notes TOT. means total length bill tip to tail tip down and side of head and back. W. wing. TL. tail. BG. bill gap. BC exposed culmen. TR. Tarsus. <u>MOULT</u>. W:R. 1-3 F.G. means right wing 1-3 and F and G are moulting tail, also described is similar way TL:L, 1-3. sex goes. ♀, ♂, ♂+, 1/4-, 1/4, 1/4+, 1/2-, 1/2, 1/2+, 3/4-, 3/4, 3/4+, 1/1-, 1-1, 1/1+, 1/1++ is egg in oviduct. <u>Abrasian</u> I have N, Nil. V.V.S. very very slight, V.S. very slight, A. slight, F. fair, C. consid, M. much, V.M. very much. W/T means wing and tail. W:S. wing slight. TL: VS. tail very slight. Stomach I have as o/o empty, 1/4, 1/2, 3/4, 1/1, full. I think that about covers it. Well will go ahead with the notes.

Cheerio best wishes from

Macmillan

all total lengths don't mean much as a cold bird may be short and stiff.

NOTES ( odd ones as types so far and remarks)

TYTO Alba. As you say much paler under and slight back difference.

11/10/35. ♂1/4- TOT.312, W.265, TL.107, BG.36, BC.20, TR.70, MOULT.Nil, ABR.W:V.S., TL:F, STM.o/o black smelly residue common this area. Bird was very verminy having hosts of lice and odd flying ticks. (spirit specimens taken)

MYZOMELA

1/10/35 ♂1/1++ TOT.139, W.76, TL.50, BG,23, BC.19, TR.21, MOULT. Nil, ABR.W/T V.S. STM 1/2 minute insects, very common, larger and brighter than northern birds. Has a buff colour phase, possibly juvenile to full adult plumage.

10/10/35 ♂1/2- TOT.130, W.68, TL:45, BG.20, BC.16, TR21. MOULT. Nil, ABR.W?T V.S. STM 0/0 empty. This was possibly sub-adult.

PTILOPUS. Gregi.

12/10/35 ♂1/1- TOT.227, W.127, TL.81, BG.23, BC.15, TR.24, MOULT. W. under was odd, TL:R.1, L.1. was odd, rump nape, all unders odd, upper back much.
ABR. Nil. STM.3/4 banyan fruit.
Very common all over area. Quite ordinary.

MYIAGRA Will sort this lot out more fully before sending data.

CACOMANTIS ♂1/2 U.T. test, uneven. L test. enl. about 3/4 and rt. test. only about 1/4.
TOT 271, W 139, TL 142, BG 28, BC 18, TR 20.
MOULT: rump, nape, crown odd. much ABR.
W/T. M. STM. 1/1. Centipedes, spiders, beetles, etc.
♀ 1/1+ TOT 250, W 130, TL 133, BG 29, BC 20, TR 21.
MOULT: Nil, ABR W:N T:S STM 1/1. Insects, beetles.

TRICHOGLOSSUS - very ordinary.
N.B. Boys speak of a yellow and green parrot once fairly common, now rare, last seen 8 years ago. Possibly in mountain area 3000 ft.?

RHIPIDURA Flav. brench, nothing special, buffy unders marked.

Pair mating shot, nest not found

♂ 1/1+. TOT 149, W 73, TL 81, BG 15, BC 9, TR 19
MOULT: Nil. ABR W:N T:S STM + insects

♀ 1/2+. TOT 145, W 69, TL 80, BG 15, BC 9, TR 18.
MOULT: Nil. STM
ABR W/T nil 3/4 insects.
Very very common in this area.

COLLOCALIA Esc. Urop. very common & ordinary. big range in measurements.

PETROICA. Mult. Similis.
white patch in wing prominent.
Not common in this area, said to be so on west side of island. No doubt new. to date have 3 males & one I have marked U.S. which I am sure is a sub adult female 0/0 or 1/4-. bullet had rather damaged that area. here are all measurements.

♂1/1+ TOT. 114, W.68. TL:46.BG.15.BC.9TR.18 MOULT.Nil
STM.1/2 minute insects ABR.W:VS.
1-black beatle T:N

♂1/1- has soft gape but has lice on it. (S.P. specimen).
adult plumage.
TOT. 114.W62,TL45,BG.17 C.11.TR.19 MOULT.Nil
ABR. nil

U.S. female plumage.
(♀?) TOT.109.W.60 TL.42.BG.16.BC.9·5.TR.19 MOULT } Nil
ARB }

♂1/2- TOT.122,W.64.TL.44.BG.16.BC.11.TR.19 MOULT Nil
ABR. W/TS

HALCYON CHLORIS
2 kinds I think, one buff unders other white unders but my full series of skins will let you do this thoroughly. It is a most confusing bird mixed lots, measurements range.
TOT.225-240. W.95-102.TLS.63-75BG.49-56 (52) BC33-42(38)TR.16-18
Colours range unders white to almost cinnamon,
Collars great variety, back big range, green to blue.
You will have a job sorting this lot out.

ZOSTEROPO FLAV. Undoubtedly new. (Will get big series for you). common in this area.
Type. ♂1/1+. TOT. 140. W. 64.TL.47.BG.20.BC.14.TR.21
MOULT. tail covs odd.
chin odd.
ABR. W:VS STM fruit seeds.
T:C

♀1/4- TOT.132.W.62.TL.44.BG.19.BC.13.TR.21
MOULT W.&T. covs odd.
back nape odd
crown much.
all unders odd
ABR. W/T. V.S.

ZOSTEROPS LATERALIS Undoubtedly new.
not very common generally but in some areas fairly common. Garden land favourite habitat.

♂range. TOT. 146-157.(155) W.71-77.(73).TL.55-58.BG.19 BC.13.TR.21-22
Yellowish head & throat, distinct black cheeks, very apparent in bird in field. grey back. large area

? Where does the type area of Tanna lie. certainly not here.
will the west side species be different & what about the high hills. 3000 ft.
This will be most interesting.
It looks as if Tanna once had much higher mountains by the size of the birds.

CHALCOPHAPS ordinary. common.

LELAGE LEUCOPYGICE very common
No females to date
♂ TOT.184.W89.TL.81.BG.22.BC.13.TR.24 MOULT W.second & covs odd
crown all unders odd
ABR. W/TVVS.
STM 1/1 banyan fruit

Migrant - TRUIGA BREVIPES not unusual.
some interesting work amongst these on the west side. later I hope as many migrants feed there.

Macropygia rufa? not unusual. fairly common.

Columba Vitiensis larger brighter & more white on chin than northern bird, is one phase, similar to northern is other phase. believe one may prove new.

Ptelinopus Tannensis
Certainly different to northern bird. believe as this is type northern is a sub spec. Hope you have northern spec. to compare with what I will send.

Anas super. Pelew. Common on lake, also teal. intend getting a canoe on to it later. measurements are on the large side & all are extremely fat. good food condition.

Pterodroma
New. very similar to bird I got for B.M. (Harrisson) last January on Liabra island but not quite such a warm brown as it, possibly only a colour phase of the same.

Harrisson has all my notes & specimens so cannot say for sure.
They should be coming in next month to nest. I obtained 3 skins all there were about the 18th of this month.
(N.B. boys speak of 3 petrels nesting on island, 1 small & 2 large.)
uppers. dark brown (chocolate) uppers,
unders. lighter, especially neck & chin.
downy white streak under eye only visable when eye closed.
iris dark brown. bill, long. black horn, prominent nostril curved tip. legs flesh colour inside black outside. feet & webs. pale flesh outer toe black (pale). Description Murphy of Puffinus Cherminieri nugax but more blackish than brown on head is close to it but much larger.

(BG.bill gape. B.C.T. exposed culmen to tip of bill. R.N.T. Back of nostril opening to tip of bill. TR tarsus. M.T.C. middle toe with claw.)

♀.TOT.404. W.300. TL.144.BG.58.BCT.40.RNT.32.TR.49.M.T.C.60
Moult, belly odd
A.B.R. Nil

♂.TOT.468. W.305.TL.137.BG.59.BCT.40.RNT.31.TR.49.MTC.62
Moult W.R,14:TL:R3,L3.upper back vent odd.
A.B.R. Nil

♂.TOT.475.W.303.TL.145.BG.54.BCT.41.RNT.31.TR.49:MTC.61
Moult neck odd
A.B.R. Nil.

Tanna
New Hebrides
8/12/35

Dear Dr. Mayr,

Firstly in my last letter I described a sheerwater found here by me & I believe I said description like Plherminieri nugax. I was all wet there & am sorry for giving you a bum steer. A rough description uppers warm black or darkish brown darker on wings & tail, under greyish, light white down on under eyelid. The measurements you have. Have some more am taking a regular series, eggs, chicks, etc. Since then I have what I think is Leaches petrel Fregetta Albigularis. Nesting, no egg. (hope to get it this week). have studied them. They are non colonial here, burrows 3-5 ft. dense under brush, ferns, etc. almost precipitious hillside 6 miles inland 600 - 2000 ft above sea level, burrow always in patch of ferns or cane grass, I imagine for identification on dark nights, as these show lighter, so far all found within view of sea. No joke chasing these guys. Another which I believe is Plherminieri nugax, sooty uppers, pure white unders slight encroachment around neck of dark feathers, measurements fit, Murphys in A. M. Nov. No 276, 1927. Have eggs, will get chicks in spirit. Nest, 6 ft burrow almost invariably, semi colonial on highest peak on Tanna Mount Tokos Mira 3200 ft, A.S.L. only place where it is others nest all over Southern Mts non colonial, missed with F. Abligularis.

Since last writing a rough summary is: On map I sent you all but extreme south of Tanna below track across island (roughly central) is done.

Pachycephala not yet met with, doubt it on Tanna.

Myiagra sorting up believe only one but big plumage range of sub. adult ♂ ♀ type.

Only one type Rhipidura from sea level to 3200 ft. no real difference.

Petroica to date have 10 skins, 6 spirit specimens incl. nestings. have nest & eggs.

Halcyon. believe 2 kinds Tanna.

Yosterops Flav. have slight brighter phase and measure size increasing from sea level to 3200 ft. No big difference from last measure.

Yosterops Lat. have slight darkening of unders and decrease of sea level to 3200 ft. not common on top.

Chalcophaps. slight variation in alt. & big increase of numbers.

Lelage. Same, have nest & egg & sub adult.

Macropygia have increase in numbers with altitude. Also only nests on top. Have eggs & nest. Grey phase present, but unlike you I believe it a new sub. spec. forming. as you will see later in my field book. main reason I believe different 1. use a call the brown phase doesn't, like a cat's mew, also use common Macropygia call but slight difference. only found above 1500 ft. & principally above 2000 ft. (3) Egg is smaller. (4) Have never seen it mate with other phase and boys say it never does although they are common together at 2000 ft. Against it I admit semi types seem to point to its only being a phase, but on Tanna anyway I believe it is definitely becoming a sub. species.

Columba Viti Lep. certainly larger & brighter than what I know of northern birds, have skins.

Anas super. pel. only duck so far on Tanna. White men & natives speak of spoonbill appearing @ infrequent intervals. Not seen yet.

Erythrura trick cyan. good series skins & spirit including nestling & sub adult without blue head.

Hypotaenidia phil. Swind. Only rail so far but am not in real rail country yet. A hard bird to collect at any time so may have been S.O.L. so far. have ♂ & ♀ skins.

Turdus pol. albif. another hard bird to collect. very shy, believe different to northern, anyway Santox Malehula which I know. a purely mountain bird here. 4 skin so far, 3 male adult one nestling ♀ tail damaged worst luck.

Hirundo tah. sub. same as north to all appearances.

Ducula Pac. tarr true to type, larger than north, certainly different to Santo and parts Malebuela, but I see by your papers Santo, Dolphin Island (Rennell's birds) have different bird names as Aust. white headed pigeon Faleo per. erusti. has no transverse bars has longtitude bars yes.

That is about all. Any books useful for here would be welcome especially a check list of some sort if you can

get them to me in time. Am using Aust. Mus. tags but you can change them over your side. Some form of calipers would be useful for eggs, bills of petrels etc. my compasses are not exactly good enough.

Question: In cases like the petrel or anything I believe new, Should I post a single skin to you at once? I see Beck did once re a petrel. Lets know by wire if this is important. I am a new chum at this game & need a few steers.

Have over 100 skins & some fair spirit stuff. Am a slow skinner, I am afraid but do my best. Am slogging in pretty hard to beat the abrasion.

Cheerio, good luck,

Macmillan

Tanna, N.H.
16/1/36

Dear Mr. Mayr,

Your radio received last week, re carrying on. Which I will do. Things down here have somewhat altered. Father whose place I was allowed to stay in after he left, is being taken by a new missionary at the end of the month, & I have to move out & board with some local chap. This naturally will be an added expense which I had not counted on, also the boys are out on strike for higher pay & although this has not yet reached my single boy whom I take in the bush etc. it may & any day am expecting him to ask for 30/- a month instead of the £1 he is getting. If it can be managed it might be advisable to wire £25 to Burns Philp, Vila, to have it as a reserve stand by. Any balance over I can return to you. If the museum funds won't run to it it can't be helped & I will just carry on as far as the cash will take me. but that won't be very far I am afraid. I still have about £10. but Burns Philp have informed me it will cost me £8 for passages to Erromanga & Aneytium. Also on Aneytium I will have to stay for 3 months & board and camping there will come to at least £3 a month, £4 with my boy. Futuna is never visited by the steamer & to get there I must charter a launch which will cost about £10 for the trip there & back & it wants doing as you will I think agree after reading my Aniwa findings. Wish you could get me a real mansized grant to do the job thoroughly like Beck had a chance of doing under the Whitney funds. Bet I could do it a damn sight more thoroughly than he did at 1/1000th the cost. Things are at a stage now that I feel it wants a year or 18 mths intensive work to finish the job properly but as I am on no wages I couldn't afford it as I have no income whatsoever & it is only my love of scientific work which made me take it on. Another thing my health in this climate couldn't stand the constant strain put on it by my present mode of living which is very simple & costs about 5/- a week. The biggest item I have to meet are cartridges & boys food as I feed several shooters at odd days shooting & passages & porters, etc. packhorses etc. in camp shifts. Anyway rest assured I am running things as fine as possible but a diet of rice & birds I shoot (even tried Falco but N.G.) isn't exactly the best in this climate & my blood isn't in the best of order, naturally this doesn't induce a cheerful frame of mind. But to get down to tacks.

We had ahurricane here on the 11th Dec. which shifted me bag & baggage and damaged a lot of my cartridges. Managed to get some interesting notes on the birds during the blow. Mortality of nestlings & eggs must have been terrific. Also got several sea birds which were blown ashore around about. Shot several frigate birds & also got skins of Anous stolidus & minutus, also Sterna anaetheta. Also Circus approximans during the blow. After the blow I went across to Aniwa Island in a whale boat, took us two days of beating up to windward although only 17 miles away. Over there I found Zesterops lateralis same as Tanna, infinitesimal differences, Z. flav. same as Tanna, perhaps brighter. Myzomela Card. same as Tanna, but noted a strange thing that females were in advanced breeding with a soft gape and apparently rather juvenile. ♀ ♂ ratio much higher than elsewhere about 1 to 3. Myiagra same as Tanna, but ♂ adult phase ratio much higher than Tanna, Chalcophaps, Columba vitensis, nests and egg, Ptilinopus greyi all nesting and common. 2 only Ducula pacifica one of which I skinned, doesn't nest, appears occasionally after heavy weather. (Circus and Falco visit the island in clear weather with good visability from Tanna) but do not nest and never stay long) Lalag common and nests. Halcyon chloris j. and tannensis and juliae far more common. No fantails at all on the island or Petroica or Turdus. Hirundo present, but not very common. Collocalia entirely absent during my stay of 3 weeks, an occasional stray seen by natives at long intervals. There is a tidal lagoon of about 3 square miles in area with many waders and sea birds, the following I got skins of Arenaria, Numenius phoebus, Limosa lapponica and ditto very large about 20% larger i.e.

A.TOT388. W212 TL73 BG85 BC82.5TR51 diffenrece upper and lower mandible 3 mm.

B.TOT446 W230 TL83 BG107 BC104 TR55.5 difference upper and lower mandible 3.5 mm.

Pluvialis and tringa. Also Sterna bergi and sumatrana sumatrana which nest on the island. Bad luck the hurricane carried out a clutch of eggs a few days before my arrival. Demigretta common. No doubt Dupetor flavicollis and Butorides stagnatilis appear here at times in the mangroves at the head of the lagoon. It is a great place for sea birds. But the fact of most interest on the whole island is the following. There are 3 cuckoos present. I spent 10 solid days with 3 boy shooters combing the island and got one very badly damaged Chalcites layardi (put in

spirit). Yet they are not by any means uncommon, but I seemed to be plain S.O.L. and although rushed hither and thither on advices of their being seen, never caught up with the sods. One, the largest, is no doubt Eudynamis, whose host I place as Lalage. The nest was not present during my sojourn, but had been shortly before (I was there Dec. to Jan. early), the other, the smallest was and is no doubt layardi. Now the boys give me the dates again in Feb. March and a bit later. The names of the three in their language are Eudynamis menwata middle size, bronze cuckoo menufatungfatung, small bronze layardi is called vanvani. What is the middle one? I think it is the New Zealand bird lucidus lucidus which I have always formerly believed to migrate through here, since finding an egg which suited the description of it in a Lalage nest onOba many years ago. Am nuts on getting this bird and if at all possible will get back there about March to clean him up. I feel sure I will prove right in the end as I have seen the larger bronze cuckoo within its migration months myself on different islands of the group and as it is most improbable it is the Australian bird, what is more likely than that it is the New Zealand one? Look at a map and measure off the following hops. Solomons, Vanikoro, Tucopia, Torres Is. Banks Isl. Oba, Pentecost, Ambrui, Patma, Epi, Tongoa, Mai, Efati, Erromanga, Anuira, Futuna, Aneytium, Marie Is. New Caledonia, Isle of Pines, Norfolk, New Zealand. Now on the following islands I have seen the larger size Cuckoo, as I call it, Bank Is. Oba, Ambrin, Tongoa, Futuna, and heard of it in the following, Merelao (Star Peak Banks) Meawo, Pentecost, Paama, Epi, Erronanga, Aniwa. Worst luck when most of these observations were made I didn't know as much about birds as I do now and made no definite records nor shot any. In those days, as Harrisson said, I knew a hell of a lot of the island birds' habitat etc. but it all with my Australian knowledge and was only a casual but keen and exact observer, whose knowledge on its own was valueless, but in conjunction with his scientific knowledge was invaluable. What always scared me was the Latin names. I can't spell properly, even in English, so wouldn't tackle Latin!

No doubt you will be very interested in this and be in as big a sweat as I am till I can settle it. Am at present laid up with a poisoned leg and chucking

handsprings to be out and about again as possibly Tanna may solve this problem for me. Anyway will try and hit Aneytium to catch them on the return and failing that, try Aniwa. But time and finances are so short, I can't get in a tenth of what I want to. Am a very slow skinner and that holds me back a lot, 8 skins a day is a big day for me. There is so much valuable time lost in moving about too, and the very detailed books I keep eat into a lot of time, measuring, moulting, etc. all run away with precious hours. If it's O.K. from now on my tags will only be numbered and all data can be got from my books, which I keep in duplicate in case of accidents to one set. Gosh, I love the work. Wish your crowd could back me properly, don't want any expensive ships etc. like Beck, that is a great mistake as it ties him to anchorages and hurricane seasons step in to break work etc. My idea is a single competent skinner. Beck left a Samoan lad here in the group, who would take a reasonable wage, first-class tents and equipment, guns and ammunition unlimited, and good food and wages could go hang for me, the work itself would be sufficient compensation for me. What I would like would be to work from Caledonia right through this group every damned island, also the Solomons and so on to New Guinea. Wild coons don't scare me worth a hoot. I was born amongst them, have lived amongst them and can generally manage to rub along without crossing their hawse. If Mrs. Whitney would only spring about £500. - for equipment and £500 a year for expenses, I would gladly take it on and bet I would bring some real good stuff to light. I could also work in bugs and butterflies at the same time and a bit of anthropological data. Chartering of cutters between islands, labour wages, etc. for porters would be the biggest expenses, also the skinners wages, as one skinner is too damn slow. Still, I know there is no hope of such a thing as I am entirely unknown and might be just a hummer for all you folks know. But enough of roaming in the clouds.

An interesting fact to light, Circus approximans got here is quite different underneath to what I called Circus on Malehula. That bird was much browner under. I definitely have Falco Per.ernesti now and it looks quite different to the other. I last wrote you about, but this may be a sex difference. The large dark petrel I think must be Puffinus pacificus, though two Australian books I have both give "inside legs and

toes dark" whereas these here are outer. Surely these must be printer's errors. Could you send me measurements and description of Puffinus pacificus to settle the matter definitely. All the measurements I have are length from bill to tail 17-1/2 inches and of all measurements that is the feeblest and most unreliable to go by. Am still moulting all specimens etc. and keeping full data available.

The Halcyons so far can I think be panned into 2 kinds tannensis and juliae, but they are a blending crowd and have a confusing intermediate stage. Anyway you can sort them. I notice a feather difference, tannensis having very harsh feathers to the feel, whereas juliae are soft and of course white to light buff. Tannensis is much darker buff.

Don't think there is much else of interest to write you, but as usual next mail will bring you a further "billy do".

Well, must close, cheerio,

Yours faithfully

L. MACMILLAN

P.S. Have a big camphor wood box of 150 odd skins completely filled. Do you want them forwarded at once, or will I keep them till I finish and forward them altogether? Keep them in camphor wood boxes which cost me a pound each as that keeps out cockroaches, silver fish etc. Will forward them in these cases. They get a bit knocked about in shifting camp etc. but no doubt they can be straightened up in the steam locker.

L.M.

Tanna
New Hebrides
5/3/36

Dear Mr. Mayr:

Yours of the 7th Dec. '35 to hand, by now no doubt you have had several others & know how the work is progressing. No doubt when you received my last epistle you must have thought I was going ga-ga and was very depressed. As a matter of fact I was sickening without knowing it. Harrisson & Lewis, the other chap with us, taking a moving picture both went badly out to it, as the strain was very great, as soon as the job finished Harrisson, as you know, having the yacht at Tahiti & Lewis going straight into hospital on arrival in New York & was there till early in December. I was the only one who kept up & what is more the same life in the same climate but the stremuous life & rough food for a further 3 months knocked me galley west. Before my last letter left Tanna I was properly down to it. The hurricane (2 not one) came & I as usual went prowling for specimens & observations etc. & got a touch of pneumonia & of course as usual fever chipped in & I flopped properly having played myself out & had no reserve left. Since then I have done little or no bird work & what little I have done I have fought the doctor about, till after a serious relapse he got really shirty & completely tabooed it in any shape or form. I am a week over it now & getting about but am pretty washed out & only doing writing work so far. Having done everything to bring up to date for forwarding to you with the skins. As Harrison will tell you I was very reluctant to stay down here through the whole hot season as it was my 7th without a change away or a holiday & as my intention to go to Norfolk Is. for a spell & return if necessary & complete the group but Harrison persuaded me against a break in the work, & as there was 2 doctors on the island I decided to see it through, but my poisoned leg showed me I badly needed a spell & change, as my blood is usually very healthy, & I really felt played out in December, but on receipt of your radio carried on & went out to it as the work was broken after all for which I am very sorry as it kind of lets you folks down, but much as I regret it can't be helped.

In a way my last wasn't a pipe dream completely, though where some guardian angel with 500 pounds per annum to back me will spring from I don't know, but I am really serious & keepa & want you to look up a few facts etc. for me. I don't know what arrangements you & Harrison have come to about my notes & field data etc. but seeing you

are supporting me & actually all such notes etc. must go with the skins to give them their full value & I understand Harrisson only wants to publish a monograph of the birds of the group & would only want a little more than a list of what is here & its habitats, I am forwarding everything to you. Anyway as you wrote Harrisson will be over with you in May and you should get this consignment about then you can fix it up yourselves. For my part you are welcome to the lot & to do as you please with it. My brain never was good enough to allow me aspirations towards being a clever guy like Tom Harrisson, but I can cover the spade work well & am used to hard work & am handy with my hands and tools, boatbuilding, navigation, carpentry, engineering, etc. all coming naturally to me & I am pretty observant & painstaking & always ready to learn a better way to do a job, so naturally am better sticking to the spade and letting keener brain do the higher work. My spelling would preclude any attempts at authorship in any line as you no doubt have noticed, but it is a kink with me, but native names come naturally as I spell them phonetically so any hard words you find in my notes, etc. remember that & the work will be understandable, my trouble is that I spell the simple words wrong too. Writing and spelling never were my forte, I only once passed in an English exam though I never got less than 90% in any maths subject. So as far as I am concerned you may do as you wish with anything I send you, burn it as it properly deserves, no doubt, or thrash some good out of it if you can. All the dope you want with these skins is going forward to you under registered post from Australia. I keep the head station books in duplicate in case of accidents, fire, hurricanes etc. so am forwarding the routine duplicate to you. I keep a separate skin book which only deals with the skins, & a similar one for spirit specimens, but the routine book is fuller & gives you more dope. Later when the final consignment goes forward the skin book will go with it for filing for reference in your own books. With these are the sub areas I have completed, & a specimen page of date on each separate species, which of course are not yet complete & I wish to keep them till they are & they will go forward with the final skins. The facts in these are tabulated from my field notes from day to day & of course cover pages in certain species. If you collect all the notes, questions or suggestions of improvements in my system (I would be glad of any steers you can give me) I will bring them up to date & forward them to you again with further completed areas & islands. I work slowly & pretty thoroughly with the idea always in view that no one need go over my work again, anyway for many years.

But this system may not suit you folks, if so tell me, as when the France was here they really only skimmed through, getting really good result though as they could skin many in a day & I can't, but I think you will be surprised at what Harrisson brings to light. I was in the group when the France was here & saw them & I knew then and know better now that they left many gaps. I hope when I finish down here there will be little left unknown of what birds are present & being Scotch will do it as cheap as possible which per head will be a damn long way below what the France expedition in the group cost. Still I would like better equipment than I have got & a single man is at a disadvantage as he can't be in two places at once & do parallel studies as checks. Under further separate cover I am forwarding the key of the skin box & a skin of a sub. adult Halcyon which I skinned in bed (damned saw-bones started talking about straight jackets but I told him it was only for one & to boil his head) & followed your instruction book. I want you to criticize this skin for me. Am afraid these skins going forward will disappoint you as they are not good, though I think they would satisfy Harrisson, who was my tutor, in most cases. But man that "wee book" is worth its weight in gold & "kins wha' it is about." Harrisson always said the museum with their steam boxes could straighten things up better than we could. All these skins bar the separate Halcyon were dried in paper & the feathers don't behave at all well but the "wee book" tip of putting them in cotton is ace high. Also as I have poor gear my skins suffer in transit down steep mountains etc. & get out of place in their papers & wont be resorted satisfactorily but the cotton with paper outside it should prove much better. I always had trouble with the wings but taking that stitch should sort that trouble for me. The gear advised amuses me when I think what I have. An ordinary cheap trade gun, mixed ordinary cartridges, a military haversack, a pair of scissors, a scalpel, a pair of forceps, a razor blade, & some cotton wool & arsenical soap. I, off my own hook used a tin in the bag to protect the smaller birds but larger went in holus bollus. I was troubled with neck and tummy feathers coming out as doing my own shooting and skinning it was often fairly long before a bird was skinned. I tried gutting them but they got messy that way & feathers suffer. (I put boracic acid in the cavity & the result would have given you thrills if I forwarded them as many new subspecies with different colour patches on the back would have eventuated. A

Halcyon developed a grey back tinged green.) Anyway from now on I am setting myself the standard of the Halcyon. I am forwarding & will maintain that or bust. Harrisson will chuckle when you tell him. I always was a slow skinner & was lucky to finish a skin in an hour & with these extra things he will see me taking 4 hrs., but this specimen skin took me just an hour & 2 minutes & I can no doubt cut this down in time to half without lowering & perhaps improving the standard. Anyway the final result will be more satisfactory. I will make a further specimen of as many as I can by the new system, so don't worry if the Petroica's etc. are not too good, will get you at least 1 good one if it takes me ten hours to skin. Anyway please criticize this Halcyon& let me know. I know its neck is bad but will get the hang of that in time I hope. I am enclosing a separate detailed list with this of what is going forward to you by this steamer, this letter being more in a conversational tone & damn ramblly but the system is somewhat played out & you must excuse me this time.

I am enclosing a book of Harrisson's with the spirit (not in it) specimens, which I would be obliged if you would give him. He will want it for working up his stuff when he comes over to you. You might drop him a line & ask him if he wants it in England & if so send it on to him. I had it packed and addressed to him to go last steamer but as he has written in it he wanted it registered & I couldn't do that till this trip when friends are going up to Sydney I held it & as you say he is coming across to you to do his work this is the best way to get it to him.

My friends will cable you from Aust. re the things I am sending them in charge of Burns Philp, to go to their 'Frisco office & you can fix up the permit of entry freight etc. & further delivery at that end which as I don't know the ropes you can handle much better. I think that is about all there is in that line to tell you. Remember There are skins in the lid of the skin box when you open it.

To answer your letter of 7/12/35 anywhere it needs answering.

I notice what you say re Ptilinopus tannensis & Myzomela & will get a decent series in these. You will notice in my maps of Tanna I have made a special area of Port Resolution area. I did this principally

because the earliest known birds were got there by Captain Cook in the seventeen hundreds & I want you to hunt up all the available records & we can compare them with what is there now. This should make a nice little paper for you to publish & should prove of interest. At present Ptilinopus tannensis is not in the coastal parts of the area so how did Cook's ornithologist get it, from a native or was it there in those days. I haven't completed the Port area yet but you should get it with the next batch of skins at latest say three months from now. I have a theory of my own about it which you will see & which is feasible, namely, twice in 60 years the floor of the port has be raised possibly then the port extended further inland & a boat going to the head of the harbour, if it went further inland in those days, would reach the present area of the bird quite easily in a short walk. See if Cook made a chart record of the inlet. He anchored inside, he couldn't know it's too shallow.

I note Dr. Murphy's remarks. I think he will find they are Puffinus pacificus or a sub species, am certain one is P. Chermineri nugase & the other is Fregata albigularis, but he will soon sort them now the skins are going forward. Have not got anotherF. albigularis as that one I got seemed to be near the last of the nesting. There were still numbers about but in inaccessible places. Later I got ropes to one cliff face but found empty burrows, an odd one is still about though. It nests in a swine of a place in numbers & odd singles scattered about which are hard to find. Have eggs & young of the other two. Was P. chermineri nugasc's nest known before? If so give me any data as I am interested because of my altitude theory about Tanna which you will see in my notes. Did Beck know 2 petrels nested on Oba? & did he get them? I badly need a descriptive reference book as a few of Murphy's papers I have give a name & a variation from another bird which other might be black, white or brindle for all I know. You heads who know it all fly a long way above my head there as you expect me to know the other bird.

Have included one completed mountain area for you to give you an idea. This area may yet turn up something as I intend doing it again so don't take it as final but I completed it to date as far as I know it which is pretty well & all I found is in it. Note the remarks in the routine book on Zosterops. Of course all these remarks appear in the species sheets.

I note your underling re Tanna, Erromanga & Aneytium being thoroughly explored. That is also my wish with a double line under thorouthly & if you folks can spare the finance I will certainly see it is done, & the finance shouldn't be heavy.

You enclose a list of birds of interest to you as you will see by a glance at the skin book so far. Erythrura trichroa only, 2 new Zosterops, Myzomela, Myagra, Petroica, Turdus, poss. 2 Halycon, Tyto (Porphyrio present but not shot yet) Hypotaenidia & one unknown rail have turned up, absent (but mentioned Aniwa is Butorides also Dupitor not in your list) which I doubt you knew was present in the group, but Harrisson can show you a skin & we both know places where they are quite numerous) up north). Guadalcanaria, Aplonis, Pachycephala, Clytorhynchus, Neolalage, and Cichlornis, Megapodius, Accipiter. Some of these may yet come to light, but till I get their skin I don't mention them except casually. Will send along any more owls I get, they are easy to collect. How many do you want for a series? I just pick them up as I go along but if I made a dead set at them could probably get a crowd. These I am sending are skinned wrong re the eyes but will do the next one correctly. Have seen no white Demiegretta to date, they appear on Aniwa Is. but are not common. Except on Aniwa blues even are not common in any completed area, but this doesn't hold for a couple of other semi completed areas. Did you know that Nycticorax caledonicus is present here at times. I saw it when here 8 years ago & saw another one recently, passed over and settled during the hurricane but couldn't get a shot at him, wind was westerly & I saw him near Weisisi, the previous time I saw one at Lenahel (& one on the Williams River, Erromanga a month later) but that is just in passing. Would hardly be likely to find him in the completed areas as the streams have no fish or prawns & the lake is rather exposed & open for that particular bird. Of course when all the notes are completed mention will be made of all such incidents even if I don't get a skin.

That I think about answers your letter & its remarks & may interest you, but lets know anything further you want to know.

Now for the things I mentioned earlier. I want your opinion on these points & although it is at present

very much in the air, your greater general knowledge will soon let you see if there is any chance of their being anything to them, & if you are interested we can carry on & maybe bring something interesting to light.

The first thing is in re Chalcites lucidus principally but of interest for other birds & indirectly with my second idea. I have lived here for years and know the N. H. from A to Z, but only found out the other day about several islands lying a bit south of us. Walpole Is. I always knew of & have passed close to but I found the following were down that way also Matthew Is. Lat. 22 20' 12" south & long. 171 20' 30" E or roughly 120 miles S S E of Aneytium & about 60 miles E of Matthew Is.; Conway Reef or Bay, with a possible landing place for birds. Lat 21 44' South. Long. 174 37' 45" E. or roughly E S E of Aneytium Is. Now with these islands there it is quite possible similar dots appear at further spots south & if you get all the data possible including submarine ridges you may find signs of a submarine connection which may have been a land ridge or chain of islands leading down towards Norfolk Is. & New Zealand which gave Chalcites its line of migration. Did the France work any of the above mentioned islands & if so what did she find. I have an idea from tides etc. and someone once agreed with my idea & said it was so, that a submarine ridge runs from New Caledonia eastwards to Walpole Island & from Aneytium southwards to Walpole Island. You might check this up and see if it is correct & whether a further ridge carries on southward toward Norfolk or New Zealand & whether any minute islands reefs or cays appear above the surface & their distances apart as stepping stones for a migrating land bird. Another point, I have no doubt we lie on the same volcanic vent as New Zealand & possibly right through to Erebus in Antarctica & you will notice if you look up British Admiralty chart 2904 that Hunter Island has funerolis & is volcanic, & probably Matthew is also. Walpole is like Aniwa Is. and may be a coral growth once a voncanic peak. Now Futuna is undoubtedly coral volcanic raised, Erromanga & north Tanna both show the same action & so does Aniwa. This shows there is a volcanic ridge about which much raising & subsidances have taken place & it seems to me very feasible that there has existed a land ridge running to or reasonably close to New Zealand by which birds used to travel in the old days.

We have a great many wader migrants also who seem to come down this apparently dead end and then there is the large swift which appear passing through & where in hades for. It is a hell of a hop to New Zealand for a bird to take by chance. Anyway I would very much like to run over the islands & cays north of here & see what is there. - N.B. see note at foot of letter to add to this idea of mine.

Now my second idea is that I will find that Tanna, Aniwa, Futuna & Aneytium are very much more closely related to New Caledonia than the rest of the group but that Erromanga will come in with the north group. I was once told that an unsounded deep existed between Tanna & Erromanga and several attempts to find bottom failed when the hydreography survey was being done. That was long ago and charts are very inaccurate even now numerous P. D. etc. appear on charts & such notes as "the coastline of Tanna is believed to be 4 miles further west than shown etc." are frequent which show how really little is known of the area. You might be able to look up the hydreograph survey between here & Erromanga & see if there is a deep. My informant who is a reliable person has been 40 years in the area & certainly tide indications etc. point to some peculiar sea floor configuration. My informant said the deep extended a few miles west (20 odd) of the two islands & between them & to a hundred or more miles eastward. Now so far Pachycephala, Neolalage, Rhip. brench. & some other birds haven't been found south of the gap. This will form an interesting study of the times of the bird spreads & the age of the subsidence if such a subsidence exists. To follow this up I will need your assistance in the New Caledonian birds, or will have to go there. What data & skins etc. have you from there? is it very full? Would your folks be prepared to back me to do that area from which I could also work in Walpole & the other islands as I believe they come under Noumea for administration but that I will find out. Walpole does I know & a French company works the guano deposits there which again sound damn interesting for sea birds. One would naturally expect this part to show a greater New Cal. influence than N. H. as one is across wind & the other dead in the eye of the prevailing wind & the Loyalties are only about the same distance from Tanna as is Efate. Yet it is possible Erromanga will show New Heb. more than

New Caled. influence which will bring the interesting deep if it exists into prominence. Lichmera appears in Erromanga I think but nowhere south of it. yet Efate to Erromanga is 80 miles & Tanna to Erromanga only 10 or 12 miles. I have no charts etc. & the funds wouldn't run to them but you can look them up. I know you are a very busy man & will no doubt curse me wanting you to do it but if it doesn't interest you don't bother & later when I am in civilization with all the data handy I will look it up & if it looks any good collect my facts & figures & hand them over to someone like yourself or Tom Harrisson to sort up & make something of.

If either of these ideas prove interesting to you let me know & we can make a dead set towards it to prove or disprove it. Remember I have lived down here & have always been interested in birds & although I haven't yet done the other islands I have a fair idea of what is there & the trend of facts so far has given birth to both these ideas. I could give a very fair & accurate idea of what is present, not different subspecies but species or types as subspecies are a specialized line which needs skins etc. for comparison & I never used to take skins. I have a big advantage in this area over an ordinary outside collector coming in on the blind. Should you find these things worth following up would your crowd be prepared to back me financially in passages equipment etc. I don't expect any pipe dream of £500 per annum but think it could be done completely for that figure unless unforeseen expenses arose. A cutter should be available for charter in Nomea at a reasonable figure to cover the rese of the smaller islands to the south. Of course if the matter was done really thoroughly it would cost a lot more & I would like to do it thoroughly as I think it would prove of great interest & all departments with an expert in each could be done hydrograph, marine life & biology etc., geology and all the rest of it. Wish Mrs. Whitney would come to light again. I would take a job as assistant or general handy man if I couldn't get on it any other way. The stuff I get down here if I do the whole area thoroughly as I am doing Tanna, which from your letter I take it you want would give a fair indication as to whether the matter would warrant further investigation & your own researches should give you a fair idea of it & whether submarine facts etc. as far as we know point to any such possibilities. Anyway let's hear about it.

As regards the job as it stands. Now you have seen the system I am working on & if you want the rest of the islands done as thoroughly you will have to let me know & be prepared to arrange further finances. On Harrisson's advice I had planned to do Tanna very thoroughly & skim through the other islands comparing them with Tanna as a type area but I am very much afraid this won't do at least it won't prove very satisfactory anyway not to me as I know I will feel the work is only half done. The finances when Harrisson & I talked them over did not take into consideration my having to board as I expected to have my father's place to make a base but his retiring to Australia & the quick arrival of the new missionary & departure of all the old friends from the island making it necessary to pay board or at least be in a position to do so has cut into things somewhat. At present I have £6 left & if you forward to reserve I asked for to Burns Philp I can possibly manage Aneytium & Erromanga fairly thoroughly. My illness cost me something & I paid for it with your funds but this I will replace by working for locals, building etc. as they all know I can do such jobs but this will cut into bird time. I wish I was free of all finance worries & could go ahead without fear and do the job as I feel it wants doing. I will have to stay 3 months on Aneytium & hope to go there in six weeks time as Tanna should be completely done by then. (N.B. - Futuna needs doing I am almost positive there is a new bird there & maybe others. Remember it is 47 miles from Tanna against prevailing wind so anything may develop as far as isolation goes.)

I am taking a quick run back to Aniwa for a couple of days to get Eudenimius & try to settle the Chalcites question as this month they should be migrating through. During my 3 months on Aneytium I will have to do it thoroughly to fill in the time so it would seem a pity not to do the only other two islands Futuna & Erromanga thoroughly. Would your people be prepared to raise $500 & ammunition etc. to back me in doing the job thoroughly. If so I am prepared to carry on here till next November or Dec. & even later providing I can get a spell away for 6 weeks during the hot season say to Norfolks Is. where I could write up all the dope to date & pick up a bit in health, then I would be willing to return if necessary. At present it costs me £7-10-0 to £8-0-0 ($30 to $32) a month to carry on, which covers food for myself

and one boy & odd porters etc. for odd days, cotton wool, spirits, etc. wages for the boy at £1-0-0 ($4) a month a 1/ a day for the odd boys. Naturally you can see my food bill is cut pretty fine & of course I make no cash for myself but that doesn't worry me although I have no private means whatever, I am interested & keen enough in the work to like it providing I can get food enough to live, & I will understand it is out of the question to pay wages in this game to any but known and trusted men as otherwise the game would be full of suckers sitting on their tails doing imaginary work & drawing their pay. But I would dearly like to do this job thoroughly & although I know Museums are cronically hard up & science is notoriously under supported if your folks spent the cash on having this thoroughly done I think the results would warrant the cash being spent. Of course my opinion deservedly carries no weight & I wish Harrisson was here as his does & he is a damn clever ornithologist because I feel sure he would be of the same opinion and from the tone of your letter I think you are also even with what you already know. It takes so long to get word between us & I would like very much to know what your folks idea of the work is that I suggest the following enclosed rough code for you to send me messages by & to let me know how far you will back me. This should take about 6 to 8 weeks at the most to reach you if less I would probably receive a message on Aneytium or on the way there, but from then on till 10 weeks later at the earliest, I would be cut off, but from then onwards I would be off & on in wireless touch for receiving but at 6 week intervals for sending till about Sept. when I should only be in receiving & sending touch at 6 week intervals. Messages are so damned expensive this end too with land charges ship charges & goodness knows what else. The rate from Australia to Tanna is 6 pennies a word & 2 pennies a word delivery charge here to the local operator & I don't pay him that extra 2 pennies from here to Australia we have to pay 1/10 a word 2-3/4 times as much even of the 8 pennies charge. But that is our commic opera or pandimonium government.

By the way I enclose the commissioners reply to my request for the import of those cartridges duty free, which they grant under the conditions which I will carry out. Tom Harrisson tried the same racket &

failed but I tricked them this time by applying to both British & French commissioners whereas he only applied to one, & no doubt the Br. Commissioner felt it would look mean if he turned it down. Anyway I am cobbers with him & I don't think Tom was at the time he applied, though he became so later. He has known me for years and evidently considers that he can trust me as in a personal confidential note he said he would have left out conditions 2 but I had suggested it myself & to make the matter smoother he included it so the Fch. commissioner wouldn't have a kick coming. Oh yeah!

If your folks want me to carry on you had better send say a thousand round of mixed cartridges, the same as before, & cotton tags, spirit etc. Spirit could be sent ready mixed in 5 or 10 or 8 gallon cream cans, with a small 2, 3 or 4 gallon can the first time, (for taking into the bush, as porters load about 50 or 60 lbs or less per head & buck at any more. For hill work they buck at above 30 lbs & demand 1/6 a day, they are a damned sophisticated lot down here & all sea lawyers). If you included a cyanide bottle & envelope folders I might do something for your mag department, especially if they send me their pamphlet & a bit of dope on what to look out for especially. The B M got a fine collection for Miss Cheeseman down here & there is some rare stuff according to both Dr. Buxton & her. You would need to send the supplies about every 3 months to keep them up to me. So far I have been very sparing with ammunition and supplies as finances wouldn't run to it. I had to cut out monthly sex & moult examination which Harrisson wanted & only do a small bit of it.

All papers of birds likely to be found, sea & land, would be valuable & a key description book is essential & a colour card. I have here American Mus. Novit. papers No. 276, Murphy 8/9/27, Puffinus No. 356, 7/2/29 Murphy, Mathews Zosterops No. A 19 5/4/30. Murphy Diomedeidae & Puffinus No. 469 3/3/31. yours. Halcyon No. 486, 29/8/31. yours. Rennell Is. avifauna No. 488 14/9/31. yours & Hamlin. Rennell Is. No. 489, 15/9/31 yours. Erythrura No. 502. 9/11/31. yours. Rhipidura No. 504. yours. Birds of Malaita Is. Br. Solomons No. 516. 17/2/32. yours. Meliphagidos No. 520. 8/4/32 yours. Chalcites No. 628 2/6/33. yours. Clythorynchus. No.531 28/5/32 yours. Pachycephala No. 590 17/1/33 yours.

Edithornis No. 651 14/8/33 yours. Myiagra No. 655 5/10/33 yours. Neolalage No. 714 11/4/34 yours. Petroica. Ones I have seen and would like are No. 365 30/7/29, Murphy.Zosterops Solomons. & No. 522 18/4/32 yours. Pachycephala Solomons & any other western Pacific papers available. Especially New Caledonia, for obvious reasons, & please send some sort of descriptive key list or books as these papers are often semi useless without. Of course books, etc. will be returned when I finish.

Have Nos. 276 - 356 - 419 - 469 - 486 - 488 - 489 - 502 - 504 - 516 - 520 - 531 - 590 - 628 - 651 - 655 - 714. Know I would like No. 365 30/7/29 - 322 18/4/32 as I have seen them in Harrissons Book & any other Landorsea, Western Pacific, especially New Caledonia.

I think that about covers all the ground. With ample funds much of the above stuff if not all could be purchased by an agent in Sydney for me at 2-1/2% & so save freight across the Pacific. Also these agents deal wholesale for us & we get things reasonably cheap. If you are interested enough & intend going in for it I would suggest you appoint an agent in Sydney & pay a credit to him to work on. I suggest a Sydney museum man as a trustee to whom I would send my requisition list & he could run over them & after sanctioning them hand them to one of the well known agents dealing here. I suggest C. Sullivan as the agent as he knows the group & seems to give the most satisfaction. The American Consul would be a good trustee but would bless the extra work I guess & love me about as much as a bad smell in a crowded train.

If you think there is anything in my two ideas you are at liberty to repress or broadcast or use the ideas as you may think fit. Whether you hand them on to Harrisson or not rests entirely with you & anything or any arrangements you may make will be suitable to me as I feel you are as keen as myself to have the job well, & thoroughly done & because I will do my end of it & find out all I possibly can & hand it on to you to thrash out & get all possible good out of it.

Well I must close. Hope the cartridges come along O.K. as I am very low in my 1000 rounds which I bought with your funds.

Cheerio, yours sincerely

L. Macmillan

P.S. Take care not to put my initial T on letters as both Vila & Sydney Postoffice have instructions to forward all mail addressed T. Macmillan to father in Melbourne. For this reason I only use the initial L. in the group. Your last letter went to Melbourne but luckily caught the boat when returned addressed L.

N.B. In further of this notion of mine. Note my theory about Tanna being a peak stretching to Aniwa Is. which would possibly a/c for Chalcites going through there as it was the old coast line. I believe I saw it once on Futuna (but field observation is too uncertain) also the comparative absence of waders along Tanna's East coast to its west coast. Yet food is there although badly affected in the volcanic area. It is an interesting point anyway. You might compile a list of any other New Zealand migrants liable to pass here.

Tanna, N.H.
10/3/36

Dear Mayr,

The steamer is late and am hurrying in a small addition. One of the infrequent boats from Aniwa has just arrived. When there I left cartridges, No 6's worst luck as I am run out of small shot, and a bottle with spirit for the boys to collect any Eudinemius or Chalcites for me. They ran over this week with the bottle with 2 chalcites and 2 cacomantis in it. Cacomantis was entirely absent when I was there and Chalcites was very rare; I only got one in 8 days intensive working of the island by myself and never less than 4 boys. Eudinemius was not calling and though several times seen by boys never by me for certain. I saw its feathers in a hair pompom (dancing ornament). The boys report it calling much at the present time. Chalcites has appeared in fair numbers just at the end of February, the 2 I am sending in a jar being what they got. Give them a run over and please explain your system of culmen measurement given by you in A.M.N. 520, 8/4/32, the culmen from base. I can find 2 bases in the palate. I enclose my measurements, my own ordinary measurements of bill being the lower line W.B.N. being width behind nostril. By your papers these look very much like New Caled. birds which may be migrating through here. It is just possible Cacomantis is a New Caled. bird on its way further north also but not so likely, so I am leaving them to go with the next batch. I make these definitely Layardi and you will note the boys call it "vanvani," and they say the larger similar bird has not yet appeared (the one they call manufatingfating). If vanvani is a New Caled. bird it seems likely I can expect manufatingfating, which may be the N.Z. bird, through very soon, and expect to be over on Aniwa again next week for for 2 or 3 days. Hope I am lucky. You will notice the native name for Cacomantis is Nuvarian, and the reason I didn't get on to its being present at times was the fact that when the boys ran over the names of birds they gave menwaeta (e is a suggestive sound, not like the usual pronounced vowel of these parts, being the long ā end altered from the broad āā with r sound, to a sort of ā ae) as a name for what may be Eudinimius and Nuvarian as its picinini or young. Anyway I don't place much faith in a native name list, and only use it as a check for anything missed, as you will notice Sauwareve covers all Sterna as far apart as Bergi and sumutrana. But this case nicely illustrates my contention that the system of using a ship like the France can so easily miss so much which may possibly be important, as the entire absence of Rhipidura would strongly lead one to believe Cacomantis never appeared, especially as this bird so strongly controls it on the adjacent island of Tanna. I think my system of working with the addition of finances to enable me to charter a craft when necessary to do intervening sea areas and places where transport is unsuitable or unavailable between areas is far better and more accurate. If I had the finances I could charter a launch here on Tanna to run me to Amytium 4 weeks ahead of the steamer, i.e. 2 weeks from now, and return on the steamer when she goes south in six weeks. This would cost about £5 or £6 at most including my return far on the steamer as against £3

return fare and more unsuitable times. I admit you wouldn't get many guys to stick the rough bush life I live, etc. but the interest in the work compensates me and anyway with a decent roomy tent, not my 6x6, a camp chair and table and a stretcher, and not my bundle of ferns and a blanket, and decent food one could have absolutely all the comfort they needed. Mind you my system is much more economical though admittedly slower than the other, but my contention is that the work is well done, has fewer gaps if any at all, and the per head cost is much less as one lives off the country more, and these advantages more than compensate for the slower work. With my system and a really fast skinner a great deal of ground could be covered (but I am a slow skinner). Also 2 men on a job invariably cut it down to less than half the time. If you would allow me a decent amount as a bait to offer a married couple I would train a couple of locals to skin and they should prove satisfactory, the woman could look after the food part as a number have worked in houses under white women. One I know has successfully run my father's house for 15 years and for 3 years at a stretch with no white woman to direct her; unfortunately she has a child and her husband is a lazy swine who lives on her mostly. But a good pair could be got hold of. Certainly with Harrisson's and my way of living in the bush you wouldn't find one in a thousand whites prepared to stick the fleas, bugs, flies and lice of the bush, but we both became hardened to it. A little kerosene rubbed all over the body stops their biting and one soon gets used to feeling them steeple-chasing about one's anatomy; the flies and mosquitoes are more annoying and harder to deal with.

Anyway run over these 2 chalcites I am sending and give me your views on them. Their measurements more nearly tally your N. Cal. ones. The soft parts of course are not too accurate as they were taken by natives who chose them from about 20 paint colours which I had on a paint colour card.

Well I must close, as I have a deal of private correspondence to write which has been sorely neglected for 3 months past and I cannot give the usual excuse of steamer just leaving as she is late this time.

With all best wishes,

Macmillan

encl.

Chalcites in small bottle in case No. 3

Tag 181 Chalcites lucidus layardi. Native name vanvani

Shot 2/3/36 in dry open hardwood scrub lands on central plateau ridge of island, 80-100 ASL, near Imali village. Aniwa Island.

Iris dark brown, Bill black, Legs and Feet blue slate under toes light.

W. 100 TL. 70; B. 11.75. C. 18. WB 5.5. TR 18.
BG. 20. EC. 13 W.BN 7.25.

Tag 182 Chalcites luc. lay. Native name vanvani

Shot 28 or 29/2/36. Shot in center of island along road between northern and southern villages, 50 ASL. Hardwood scrub and garden lands.

Soft parts as above.

W. 100. TL 70. B12. C 17.5. WB 5.5. TR 17.
B.G. 19.5 E.C. 15.5 WBN 7

Bill gape Exposed cul. W behind N

If it is worth while and of interest a radio might catch me in time to give me an idea of how interesting or interested you are in them, but they may have shifted on by then. I could always catch them returning towards the end of the year though.

Tanna, N.H.
11/3/36

Dear Mayr,

Steamer has not arrived and sea kicked up to blazes. Impossible if she comes to work this passage or Lenakel, and probably Weasisi is impossible. Only chance she has is to work Black Beach and can't send the specimens up there as it is pouring rain. Looks like another hurricane working up, she may not call at the island at all. If so this won't go, but she may land mails up north and hang on 6 hrs. to let us get mail away, which means a runner from here to there. Chain of lookouts from north to here to signal her approach, which is usual custom in bad weather, and half an hour after anchoring we will know where to send. Registered mail may not go as in that case no passengers will be taken and I friend can't go but may send it ordinary mail.

Must close,

Macmillan

Tanna,
N.H.
21/4/36

Actually on board off
Erromanga, before landing
(notes concern Tanna)

Dear Dr.,

Many thanks for the $100 which arrived O.K. & just in time. The cartridges have not turned up & the work is held up somewhat as the available cartridges are most unsuitable, as they are unreliable loads & large shot the smallest I can get being No. 4. Am battling along as well as I can. Have worked my passage on the to save money. They were short of a super cargo so I took it on.

Am hoping to have sufficient cash to complete the job especially if the cartridges come soon but it may be advisable when meetings for grants etc are held to arrange to have another 50 or 100 $ available but don't send it till I wire or write as I hope to be able to manage without it.

The skins are going forward this trip, on through freight to New York. Burns Philp & Co. will arrange with you re freight & charges etc. & advise you of their arrival. Hope they arrive in good order.

Re mammals, will do all I can, will get traps etc. Have one specimen in spirit of the rat tailed bat.

Re the colour card. What I want is in your papers of the A.M.N.H. you say same as Ridgway's colour standards. My trouble is that I have not a good colour vocabulary & need some guide to colour shades. The B.M. have a small booklet of colour shades numbered I believe by Ridgway system as they are R. 104. etc. & on tags etc. Iris bill legs & feet can be marked in brief by R.104 etc.

You ask for my name & full initials etc.

Thomas never use the T. in the N.H. as my father uses that initial & I use L.

Since writing last I have definitely settled that Eudynamis is the cuckoo (large one) on Aniwa as I have a skin from there. Have 2 from the Mts in South Tanna one with rusty unders poss. juvenile. Have Porphyrio from Tanna. Also another Petrel, eggs also from the Sth Cent Mts. probably brevipes or P. l. masafueroe. Will send measurements for Dr. Murphy next trip when I have more time but my duties on

board cut my time short just now. Mention of petrels reminds me, am enclosing my reply to Mr. Matthews re petrels. He was to have them but you can see by my reply to him what my ideas on the matter are. If you wish to make arrangements with him, do so by all means but that is your business. I consider my loyalty is due to you for your standing to me as you have & cuts out all claim of him to any premier claim to the skins. Also I have received no finances from him in any form even yet so he has no claim on me. As far as I am concerned he is just plain S.O.L.

General birds added are another Falco Per. Ernesti, Ptiliniopes Tannensis. A previous unrecorded wader C. mougolius I think.

Am going ashore at Erromanga & hope to get some good stuff there, but am short of cartridges, cotton & spirit.

Am enclosing a specimen of the labels I am attaching now. Let me know of any improvements you can suggest. Of course your label with official number will be added when it arrives in N.Y.

Don't forget to let's have the books back later to bring up to date.

Well I must close, Many thanks & best wishes,

from

(copy of letter enclosed)

Tanna
New Hebrides
21/4/36

Dear Mr. Matthews:

I have to acknowledge receipt of your letter dated 1/1/36 re Petrels.

I understand the arrangements were the A.M.N.H. were to have all skins if they supported me for £60 on all but the Petrels if only £50 & you were to supply the £10. As we heard nothing from you and the A.M.N.H. have since financed me for nearly £100 instead of £60 I consider they are entitled to these skins also & the skins or rather the first 3 kinds found have already gone forward and the fourth will shortly follow.

I understand you are a private collector & should you wish for specimens I will supply them after I have completed my work for the A.M.N.H. but I feel in duty bound to give them all my time while they support me & first samples of all skins. If you want to go further in the matter by the time I received your reply I would I think have finished for the A.M.N.H. & would supply you with a series.

I have eggs & young etc. of 3 of them. P. lhermineri nugax being new I believe and have notes and study of colonies etc. of them but they are all going forward to the A.M.N.H.

You might come to some arrangement with them to work it up with Dr. Murphy but that is your business.

I remain

Yours sincerely.

L. Macmillan

Actually on Erromanga

Tanna, N.H.

21/5/36

Dear Dr. Mayr,

Owing to a mixup I got no mail last trip so don't know if you wrote. As I said in my last the skins have gone forward and you may possibly have them by now. There will probably be another case of skins going forward in six weeks time. There will probably be no spirit or nests or eggs going forward as not many are nesting just now and I see by your booklet you don't go much on spirit material except for bone formation, etc.

It was my intention to go to Aneytium by last steamer but an SOS came from an old friend and neighbor on Erromanga so I came on up here. My idea that Erromanga would prove northern New Heb. seems to be working out so far. I have done most of the NW side of the island and so far and find Petroica is the same as Efate, Coracina is present, Lichmera is present, Zosterops are the same as Efate but it is just possible there is a cross over of borders and Tanna lateralis is also present here. Further work will prove this definitely, at present it certainly looks likely. My having to use local cartridges is very expensive and somewhat damaging to skins. As I have to shoot to one side so as not to damage skins to much so I have a big percent of misses. Also this is a big island with few people (300 odd) and poeterage is a big and expensive problem. They are too well off with selling sandal wood to want to work hard as porters and one has to employ them for 2 days coming and going from their villages to porter stuff for a day, consequently paying for 3 days for one day's work. They are lazy blighters too at any time and have to be constantly prodded. Wish I could afford to have a permanent 3 Tanna men with me here and they would do what it takes 5 Erromangans to do. The whole fact of the mater is they are too well off, the average income of adult males being about £15 a year from sandal wood, etc. Their women are better porters but the men won't allow them to work for others.

As far as general things go, my address is still Tanna. Burns Philp have instructions to sort my mail from Tanna mail bags and hold it for me till I come aboard at whatever island I may be at. By leaving the address Tanna, I have a better chance of getting odd intermediate mails by steamers which occasionally call there and not at other islands in the south.

Finances. I still have a few pounds but Erromanga is proving a good deal more expensive than I expected, also no cartridges have come to light yet and I will probably need a good few again very soon and the percentage of misses is very high. It would be advisable if possible to forward the £20 I asked for last mail. If you intend backing me properly a further 1000 rounds of ammunition will have to be forwarded when you receive this (duplicate the last order) to arrive in time after the others as evidently it takes a long time for goods to come through from the States, as you sent the last in January and it is now May and they are not to hand. I doubt the 1000 rounds will all be finished but certain lines of them will be and will need replacing. I am quite anxious to hear whether you will back me fully and whether you want New Caled. done as the work here is proving most interesting and certainly points as far as I can see to a definite 2 zones, North NH and New Caled. (supposed N.C. as I don't know much of it). Am enclosing a rough summary of what has come to light here on Erromanga so far, it may prove interesting to you.

Harrison should be across with you by now I suppose. Would certainly like to be present with you as he is a great bird man and the conversation would be worth while listening to.

Well I must close. Best wishes from

L. Macmillan

Erromanga
N.H. 23/5/36

Dear Mayr,

In great haste while steamer is in, just a scrawled note. Since closing the near dated latter have found Clytorhynchus, Petredoma brevipes nesting, seen Erythrura? and believe Serygone, but more next mail. To answer yours of the 20/1/36 which is the latest of yours to hand.

Re Macropygia grey phase, I am now inclined to your belief of a colour phase but it needs more investigation. Re juvenile being grey I doubt that as you will know by now. I have the egg of a grey phase bird.

Re Falco you are no doubt right the longitudinal stripes are of a juvenile.

Re sending by mail any specimens, there was a French chap, geologist and curio collector who is a snake in the grass and he has left the southern group. Heard indirectly that the Zosterops was possibly new, but only 2 days before he left, he tried to get a boy to get him some so I am told but failed. Anyway he is gone now. We'll probably forward a small batch of 100 skins or so by next trip.

Your cash already forwarded will last me till July by when you will eceive this letter and as I honestly don't think the work will be finished by then, or not thoroughly, I will require the cash I wrote about in my other letter, also cartridges. By the way the cartridges are on board but cannot be found. Gosh, this is a hell of a hole to get things done and most of the people are an incompetent bunch of blighters. Am prepared to carry on here anyway till the end of the year if you will support me. Let's hear by wire what you want done and if you will support me even if only to the tune of $59 a month; I can carry on somehow on that. Am having much better health and the cool season is improving me a lot. Work is damn interesting as no doubt you also think from notes.

Cheerio,
yours,
Macmillan

Whistle of steamer going like hell.

Thanks for triplicate list sent re birds of island.to hand same mail.

Note what you say re shifting camp before skins are dry, but my rough living and dearth of equipment rather handicap me in this respect, but I do the best I can. Fire I never use, a hurricane light turned low and sun on good days. But rats are hell and have to be constantly watched.

Erromanga N. H.
6/7/36

Dear Dr,

Only time for very hurried note as arrived down late from Bush.

Many thanks for $200 forwarded, damned white of you and I will see you get your money's worth and you won't regret it.

Do Myagra have a deamorphinn? Have a completely black ♂ Myagra, according to natives only found in one small area of South Erromanga, one in every 50 of the other. Haven't its female yet. Is it a new species or only a freak? If the breast feathers of Myagra are disarranged they show the black underfeathers so it may be only a freak. It is a dull black but the shiny head as usual shows definite demarcation. Am going into it thoroughly and hope to get a few more. Have good series Turdus from here, not as wild a Tauna. Have 170 odd skin ready to go forward but haven't had time to pack them carefully so will forward them next trip. Have one Phyorio from here, is not common and very shy. Hope last lot opened up O.K. and the next lot arrived O.K. Will put them through the usual B. P. Channel so you can arrange freight permits at your end.

Roughly have good series, Petrocia Rhipidura, Halcyon, Turches, Myagra, Pachycephala, Cacomantis, Lichmera, Coracina, circus, all pogeons except Columba and Macropygia. Fair lots of Myeyomela, Gosterops Flav & Lat. Odds of Phyorio, Demegretta blue & white, Trighoglossus. Have seen a sea eagle and may get him. Will get a good series of Eudyminus. I hope as it is said to be common on E side. By the way it kills small snakes.

Well I must close,

Cheerio & many thanks,

Macmillan

Tanna
New Hebrides
18/8/36.

Dear Mayr,

Have 2 letters of yours to acknowledge and receipt of 2 papers but will deal with these in turn.

Firstly I have to notify you of a further consignment of skins going forward by this steamer, there are about 180 skins approx. Am not sending eggs as there are only 3 petrel's eggs. These are mostly Erromanga skins but a number are Tanna. Am not sending a key as I have busted the guard of the lock and any rt L lever will open it. I use a bent nail. Full particulars are as follows. 1 camphor wood trunk marked on top.

Dr. Mayr/Dept. Ornth.
Amer. Museum Nat. Hist.
New York
With Care
Stow this way up
Special Cargo

Ends AMNH
New York
U.S.A.
Special Cargo

Have put the forwarding of them in Burns Philps (South Sea) Vila office manager's hands. Have advised him to collect freight, etc. your end. I suggest you pay their San Francisco office or if they have a New York office pay them there. Have asked him to advise you of the probable date of arrival and name of ship. Also told him to hustle them along. Hope they arrive O.K. and in good order.

There are no field notes going forward with them as the books haven't come back yet and I only have the one set here which are not quite up to date owing to an attack of flue which has laid me back quite a bit. Still the labels are very full of data and should cover all your want for the present. You say you won't fight Harrison over the notes. He gets the other duplicate of all field notes, it was only anything I said in my letters re ideas which I meant you were to do as you pleased about. It is because he is to have the duplicates that the

measurements are all taken as he doesn't get the skins and in his monograph he would want a bit of data. Personally I can't see that such a monograph can be of much use. If you have finished with the books send them back and I will fill them in up to date.

Well to answer yours first of March 3rd which has only just arrived (18/8/36) as it has been all over Australia for some unknown reason. There only seems to be the questions re doing the Loyalties and New Caledonia. I will answer this at length by mext mail as time is very short, but I can definitely say here and now that it would be impossible to do it as cheaply as I can do these parts. I know the natives and have a few friends on these islands which help very much.

To answer yours of the 19th May. I hope the skins have arrived long ere this. If I had means of getting a reply I would wire you but it hardly seems worthwhile as it will be six weeks at least before I get a reply. But I will consult the wireless operator on board, he may know when a warship is due in between and I could get a reply by that. Our local operator returns in six weeks time so if you want to wire me I will get it from the end of Sept. onwards.

I note your remarks re the specimen kingfisher. You will find the present consignment suffers a lot from the same complaint of too tight wrapping. I understood from Harrison that in the steam box this would be remedied. How about running the bellows over them. Some of this consignment are not too good in the wings and have numerous errors in filling. One skin is not well degreased so I left it in its paper to avoid greasing others. Some of the petrels are rather greasy. The juvenile's cotton is a boon and any previous mistakes I will try and remedy.

Many thanks for the $200 which arrived last mail, being registered it arrived ahead of your letter. This will enable me to carry on for a while. I have made good the museum funds which I used when ill by doing a boat building job for a local. You ask what further materials I should want. I think all you need send is a further lot of ammunition and cotton and later some cash to cover final expenses. If you are sending cartridges, cut out the 250 round of No. 12 G and send 500 rounds, 150 of long range a 1/2", 100 of ordinary, No. 410G. No 10 shot long range and the 500 rounds No. 16 G. as before. I will need no

further cash till at least November as I have sufficient now to last me till then. A further sum then would be necessary to carry on till say Feb. when I want to go out for a spell, though I will go into that fuller by next mail. You had better await my following letter.

I note what you say re the new specimens on Santo and that you wouldn't support me to go there. As I am not a man of private means I am afraid I couldn't afford to do it as the fare alone would be a matter of $120 from here and then there would be expenses there. I may wangle a passage on a cutter and make a dash at it but I don't think it is likely. The entirely new bird he got on top of Santo, as well as a few more cichlornis as you only have one and Dupetor would be what I would go for. One place on Malekula I know I would get half a dozen Dupetor. It breeds there so is not accidental.

It is certainly heartening to have your high opinion on my field notes. If you intend publishing them for the love of Mike edit the spelling and grammar. Harrison will get his duplicate copy of them but they will probably be too late for him to publish with his other work. I haven't heard from him for some time. It might be better if you await the full and complete maps of sections and the full data before you do anything. My maps are only very rough as my aneroid is on the blink, the altitudes are not too good. Could you possibly send me one. My compass is fairly accurate as I test it now and then by the steamer.

There is no doubt about port Resolution having lifted as it has done so twice in the last 60 years. 2 lifts of 15 ft. But more of this anon when the notes for that area go forward.

Am not surprised at your surprise at the absence of Guadalcanaria and Aplonis. My idea is still that the gap between Tanna and Erromanga is long standing. As you will see by the Erromanga skins going forward that that island seems more Northern New Heb. The complete miss of Pachycephala seems stranger to me as it is on Aneytium. I won't say Erromanga has no Aplonis, it may be in the hills. Naturally Aneytium I can't say yet. I hope with luck to go there next trip, six weeks time (N.B. address all communications to Tanna, the steamer folks hold them for me as they know where to find me).

Nycticorax is a frequent enough visitor here to warrant a native name but it is not at all common and I doubt it breeds here. Dupetor certainly breeds on Malckula and quite possibly in the Southern group. I don't think Nycticorax goes as far north as Efate but it may. I haven't seen it anywhere up north and only twice in the south, they probably come across from the Loyalties, though I see you don't record it from there but it is not too far a hop for it from N.C. to there and then here.

I think Chalcities luc. lay. is definitely migratory or sub mig. or else there are definitely 2 kinds on Aniwa as the influx twice a year shows. I must get some skins of it if possible. What does it parasite on Aniwa. Gerygone is not present. Cacomantis series parasiting Petrocia of Erromanga is fairly full in this lot of skins going forward.

Well I mkst close as the steamer is about due to leave.

Tanna
New Heb.

30/9/36

Dear Mayr,

Yours of the 7/7/36 to hand which I will answer briefly as I am somewhat pushed for time. Owing to not being a man of private means I have had to leave off the birds for a while and take a job to get a bit of cash to meet private obligations incurred while stiff in the trading and planting business and pay off my account with Burns Philp whom I owed $240 but which I have now reduced to $120 and will reduce that late. Naturally your note telling me to not consider the collecting a burden and to work it in as I could was a relief.

Re Turnix, I have not seen it on Erromanga but have a report of a quail from a planter on Santo, Harrison has this in his notes which I think are already published. To the best of my knowledge there are no distinct grassland birds on Erromanga.

Re the Loyalties I have already written you via Noumea a few weeks ago.

The $200 should last me till the end of the year by which time there shouldn't be a great deal left to do.

As you suggest I will fill in further books rather than risk having you send me back the others in case they are lost and you can draft them together on arrival your end.

Must close. With best regards.

Yours faithfully,

L. Macmillan

Tanna
New Hebrides
4/11/36

Dear Mayr,

There is nothing of yours to answer this mail. You will have received my letter re the Loyalties & New Caledonia but I am writing further on this in a day or two as I have since heard a few facts from Nomean frenchmen re costs etc. & am afraid my first estimate is too low, & any foreign concern need expect only the harshest treatment from french officialdom & as there are 3 officials for every 25 of population they say one can expect a thousand hindrances & pinpricks from petty officials in all shapes & forms. They can be swines too, as I know from the few we have here, generally speaking they are a rotten lot of guys. And as for the average run of them ever beleiving a man can work for science for nothing & their deep rooted conviction that all Americans & American institutions are rolling in dollars I can see we must expect to be soaked in every way possible. I am credibly informed many little game & timber officers are appointed in local districts & I will have to expect a thousand pin pricks from them.

There may be a further consignment going forward in six weeks time or I may hold it up for a further six weeks & send a larger one then to avoid excessive freight for minimum charges.

Will need further fund by the end of January or early February when the work should be about completed. Am steadily pegging away but principally filling gaps & completing series of birds at present. Am after an interesting black rail at present. Will write further by British mail in a few days time.

Yours sincerely,

L. Macmillan

Tanna
New Hebrides
5/11/36

Dear Mayr,

Have just heard the steamer is calling along the coast tomorrow & that by catching her I can save about 4 weeks delay in Vila as there will be no outwards steamers till Dec. 9. So am scribbling this off in haste to send by runner at daylight. As you will see my estimates are $200 higher as I have just heard that the cheapest board I could find in country districts would be $2 a day. I include such exorbitant charges in my estimate but personally believe I will keep well below such a figure & of course any surplus would be returned to your trustees, but they would have to be prepared to face such charges if I am wrong. Another thing to be considered is the franc having fallen on the exchange which would work greatly in our favor but this might be counteracted by the grasping "pouliu pesant" French taking me down, but I know the type from these islands & with my scotch ancestry might prove a match for them. This estimate is pretty liberal, I believe, but I have no previous experience of estimating such expeditions but believe I have allowed myself a 10% margin. As all the funds would not be wanted at once we could gauge things better as we went along. It seems a hell of a big figure but I don't see how I could do it for less in the time as I have no friends in the place.

This mail I heard there was a reasonably good chance of my obtaining a permit to collect in both Caledonia & the Loyalties, but am warning you they may apply to your authorities to establish my bona fides as a genuine scientific collector & not just a commercial or private collector.

To run over briefly the data I gave fully in my last letter. On my own collecting, which is slow, I reckon on

3 months to do the N.W. mountains & fill any necessary gaps in your collections of New Caled.
Marie, having no altitude differences 2 mths.
Lifu " " " " but larger 3 mths
Uvea " " " " 2 mths.
Small islands round about 1 to 2 months.
Allow 2 mths for waiting transport, travelling & odd hold ups.
Makes a total of 14 or 15 months.

As I said in my other detailed letter I included nothing for cartridges at the rate of 1000 a quarter, cotton wool, labels & duty on these articles, nor freight on them or freight on specimens to you. These could all be paid & supplied your end. Again food stuff etc. for camping might be supplied by you free from firms in the States much as British firms assist expecitions. One thing the duty into Caledonia on foreign goods is very high I believe but if you got it for nothing it would be cheaper sent from your end. You would reckon on a consignment quota of ample food stuffs for one for 3 mths, as quarterly consignments would be the best & easiest handled & redirected to wherever I was. The meals I would board for would allow me ample margin for feeding odd labour which I would have with me in the bush. I would collect any mammals especially wanted, reptiles, spiders, ants, etc. & any odd special moths or beetles wanted, but only if it does not hinder the main work, so these departments might assist you financially, they could supply cyanide bottles & vials & jars but I have allowed for buying these in Australia & saving freight, also a No. 16 or 20G gun & a 410G gun as my guns on this expedition are borrowed. You may be able to supply much of the materials I mention briefly in my rough estimate enclosed & save the price of them but that could be decided later your end. I hope to go to Australia about March or April, & have included my second class fare from Sydney to N. C. which would be about $50 & is about as much as it would cost me to go from here to New Caled.

I herewith enclose the rough draft of my estimate.

Yours in haste,

L. Macmillan

Tanna, New Hebrides,
10th Dec. 1936

Dear Dr. Mayr,

There is nothing recent from you to answer as it is over 3 mths since I heard from you. I hope to hear by this incoming mail as you will have received the first consignment of skins & had time to reply to give me a summary of what you found. By this present date you should have received the second case of skins, principally Erromangan. I have a 3rd case ready to send off & part of a fourth but will wait till it is completed & send them all off together, possibly by the next steamer.

You will have received my last letter re the Loyalties & will no doubt reply to that in time. I am by no means certain my estimates are correct but tried to keep on the safe side but it is possible I may have underestimated as I certainly did for the Southern New Heb. but as I am getting more expert at skinning it is just possible there would be a balance left over.

The work here is going ahead steadily & am filling up sets of all species etc. 4 of the commoner and more of others of interest & of those you previously mentioned as of interest. Owing to a slip up in the usual shipping arrangements & all local launches being laid up for repairs I am stuck on Tanna & don't see any hope of getting to Aneytium under 3 mths from now. This badly upsets all my plans as I hoped to be finished by that date. What I can see now is that I will have to cut out my holiday & go direct from here to the Loyalties if you decide to back me in that trip, as I would like to commence there in May or June. No steamer calls at Aneytium before Feb. so that if that island takes me 6 weeks as it will at least & I have to wait a further 6 weeks for the steamer (it calls 3 mthly) that takes me well through April so I wouldn't have time to go to Australia or even Norfolk I.

In the meantime I am filling in time here. You might tell Dr. Murphy I am making an especial study of the most accessible P. Therm mugax colony on top of Mt. Tokos Mirra as its nest was previously unknown. I will send it along with the field books at the completion of the work. Strange to say P. Frigatta Albigularis does not seem to be about this year as I have not found a single one. We have had an exceptionally dry year, a

drought, but this should not affect this bird. Possibly they were late nexting last year & had completed nesting this year before I went after them as I guaged my time by last year. But even the natives have claimed they were scarce this year. Am also making attempts to catch rails, 3 of which are on Tanna but have so far been unsuccessful except with Hypotoenidia of which I have a good series. Porphyrio is exceedingly scarce this year possibly due to drought affecting their food. Am arranging a trip through an entirely unexplored & unpopulated rugged area in the southern mts. where natives claim no possible track exists but with ropes & gear I believe I can get through safely. Equipment will have to be of the lightest so only raris bird will be collected. The hills are a bit powdery at present & need an inch of rain to make the going good & bind the surface a little.

Owing to the extra delay through the steamers I will need about £30 more to complete the survey of the whole southern group so if you send along about $150 by Feb. I will be able to finish it off thoroughly & be clear to do the Royalties next year. Any shortage of cash between now & then I can make up myself as it won't be much as I have $40 in hand still and won't be using my own cash for a holiday as I intended.

Well I must close. Trusting to hear from you this mail, I remain,

Yours faithfully,

L. Macmillan

Tanna, N. H.
23/12/36

Dear Mr. Mayr,

Two of yours to hand dated Sept. 24 & Oct. 1st and am answering same as steamer will be in for 3 hrs.

Firstly I must thank you for your kind interest & all the trouble you take to help me to improve my standard of skinning. Please say exactly what you think and don't spare the rod when you consider it necessary & remember all your criticisms are highly valued at this end. As I see it the job is not worth doing at all unless it is done well & my experience is so scanty that I must look to you for advice. I have noted all you say. After reading Dr. Chapman's book I had an idea myself that you would find the first batch of skins a long way below par & if I remember aright I wrote you in that strain at the time & sent along that trial Halcyon skin for criticism under the new method as it takes so long to get word backwards & forwards between us that I wanted to know whether I was starting the new system along the right lines. Even the reply to that didn't reach me till after I left Erromanga & you will find my worst fault in that Halcyon i.e. too tight wrapping, is prevalent in all my material up to that date. Even so I think you will admit the second case of skins, which you should have by now is 50% ahead of the first case by the old system. It will open up again too tightly wrapped & with the old fault of cotton wound around them but in future this won't happen again. I think when you receive those I have on hand here at present you will find them about 10% better than the Erromangan skins. No doubt you rightly consider they will need to be worth bothering about. Also down this end I am constantly finding newer & better ways of handling things. My cartridges were not the best, those you sent me were good, but even in these I have improved on them for smaller birds by using a 22.c rifle & firing a small shot cartridge. If I do the Loyalties for you I will send a list of the types of cartridges to send & for small birds will use the 22c rifle solely, so much of the ammunition will be composed of this. They are only 1/4 the price too. By the way send no more cartridges for the Southern New Heb. I now have ample to finish & may even return a goodly number. I will need about £35 cash to finish the job thoroughly but that is all I think. As far as drying skins is concerned, I never had much difficulty there

except in my battles against insects and rats. Since receiving Dr. C. book I have built myself a dryer as recommended, previously I had several ingenious devices, but the ants stole a march on me once or twice and damaged a Porphyrio head rather badly, this being the worst casualty I think. We can sometimes get moth balls, but supplies are irregular and prices exhorbitant. If I do the Loyalties I will take a large bulk supply with me, a couple of 5 gal. tins full, also camphor as i find this entirely excludes ants even in open cases. I am learning all the time but please remember you can do more to help me improve than I could find out in years and as I have no previous standards to guage my efforts with I can only look to you for guidance and correction and please be as severe as you can as only by such means can my work be of any value to science and if it is of little value I am wasting my time and your valuable time also to no purpose and it would be better for all concerned to leave it alone and let others more capable handle it. I don't mind being called a damn fool if I am a damned fool and will always take a telling in any kind of job from a man who knows more about it than I do.

To deal with each item of your letter in turn. (1) Cleanliness. I think i have improved in this somewhat, occasional birds brought in by outsiders may still show this to a large extent but my own shooters and self are pretty careful. (2) Degreasing. I find trouble with especially with soft skins like pigeons etc. even when using all or any of the methods recommended. (3) Stripping secondaries. Was taught this way by Harrisson but am giving it up but find difficulty in getting wing properly clean. Does it matter if a little meat is left towards the wrist. (4) Now always use wire but find difficulty arranging birds for wrapping. I am so damn irregular I get annoyed with myself. I turn out a good skin and the next is "punk". Often I wrap up a skin and it looks o.k. but when unwrapped is crooked, head turned or something such. Note what you say re fuller stuffing but have laterly tending to keep on the small side to avoid over filling as Dr.C. warns against it. (5) & (6) Have always had difficulty in this arranging of feathers, get them all to look o.k. but when unwrapped there are always some out of place, have been battling with this problem since Dr. C's book arrived and tried all his wrinkles but haven't yet got the knack somehow but may suddenly find out what is the trouble. (7) Drying. Find no difficulty except for pests. (8) Note what you say but it's hard here as specimens have a strange distribution & I seem compelled to make numerous camps. The big difficulty is my slowness at skinning as to turn out a really good skin always takes me an hour to 2 hrs. except in certain small birds or kingfishers, thrushes, etc. Chalcophaps takes 2 1/2 hrs. and then has nearly as much sewing cotton as skin left. But maybe I will improve. No doubt you must think me quite a fool and very incapable but I can assure you if it was an engine or a house or concrete work it would be done first class,

and if you honestly think I would be better doing such jobs don't be afraid to tell me so, but between you and me I would hate to let any job beat me, and I am not beaten yet by a long chalk, like Paul Jones, "I have only just begun to fight."

The second letter. P. tannensis a relief I won't have to skin any more. Grease worries me here. But will make one more really good skin of each plain wing and white spots in wing. Cacomantis. If I remember aright those first skins were rotten and even I myself was dissatisfied with them even under my old ideas and system of what was good. Like yourself I think bird is the same everywhere. I sent a fair series of them from Erromanga. Tyto. Very interesting and note your remarks re different measurements. All my measurements are taken for your benefit in progress reports and for Harrisson but if I am as inaccurate as all that had better lay off it altogether. Maybe I don't get the feathers laying properly. In 2 cases yours are longer, one case may be a transcription error or sight error of 100, either of which is inexcusable. I skin a lot at night by hurricane lamp light and may be amiss. Are feathers left natural curve or drawn straight? Have forwarded further specimens I think, but failed to get a single Erromanga specimen, and only once heard one, in spite of having 8 boys for 2 days and evenings after it. They say there it disappears at times for long periods? Must investigate the why and wherefore later? I made a bad mistake under the old system re eyes and position of head. I now skin them the way recommended. Have one on hand with the present batch. Do you need more? Halcyon chloris. I had long ago come to the conclusion that there was only the one subspecies. How does it compare with Erromanga types? Lalage leucopygia. I think also is the same every= where. Turdus. Very interesting. Haven't been over successful with females or juveniles on Tanna but have a number more specimens on hand. Have heard a turdus is present on the 2000 ft. plateau of Futuna Island. Petroica. Have good or rather they seem fair specimens to me of ♀ Pet. on hand now, but am right out of luck over subadult plumages, would almost believe they hadn't one if it wasn't that I have got 2 at different previous times. I have not seen one for over a year. Were the Erromanga series full enough? Myzomela. Interesting and all the better for clearing up. Zost. flav. You suprise me in a way as I was sure you would find this was majuscula. I felt sure the type specimen for flavifrons has been wrongly labeled and was got on Efate and not Tanna. Could you find out details of it and give me a copy of the label, maybe some mistake in a native name has been made and I could supply a clue. Or if it is one of Dr. Ingils's I know many mistakes were made over his stuff, as it was taken as Aneytium as it came from him whereas it was got by other missionaries on other islands. Zost. lateralis new subspec. Please don't name it after me, wait till I have done something in the ornithological world. I am very much

against the naming after people who have done little racket. A man like Gould or yourself or anyone whose life is given to the work and who has made a mark is only right, but I have seen so much in Australia of the subspecies racket where one counted the bristles on a tail feather and finding 2 short named a new subspecies in honour of a friend, with a sub rosa understanding that the friend promptly did the same and returned the compliment and then each set up as an authority and went ahead with the social round of fancy dress balls and the prize for the best representation of a bird by a man and by a woman. Which was about the highest point ever reached by the Aust. Ornith. Union when I knew it. It may be better now but I doubt it as it would take dynamite to shift the old pogies who had their hooks in it. Campbell was about the last of the real ornithologists amongst them. Mathews is a particularly shining example of the naming "after you after me" type, though I know he is a far greater Ornith. than I will be it is only his cash has made him so and a man of a truer type would have made more with the same opportunities. No to me the work is greater than the man, and personal glory goes for nothing alongside the perhaps not so blatent but nevertheless more valuable and true glory of the work itself for its own sake. In most cases I believe in naming by a type area Tannensis or a description of a feather of the bird. If you have named it or still wish to you call it Macmillani say it is named after my father who did 40 years work here on the island and has undoubtedly done more for the welfare of the island than any other person. Maybe you will think me queer but that is how I feel, and if I was worthy of the honour wouldn't mind but I do not feel I have earnt it. Don't think I do not appreciate the honour and your kind thought in thinking of such a thing but I really feel that until I have made a real mark in ornithology I have no right to such a distinction. In spite of Aust. methods the honour has not be cheapened because the honour doesn't lie with the name but in the work itself. I trust the work will ever be great enough to me to prevent me ever feeling I was degrading it by looking for cheap fame. Much of the work Harrisson has done on anthropology of Malekula was my collecting and I made the same stand there. I haven't the brains or ability to ever write a book, can't even spell, and someone would always have to thrash it into shape, which means it is his brains which make it worth while therefore his is the credit. I know my place and my limits of ability. I can do the spade work and am happy doing it and leave the raking into order to more capable hands than mine where brain work is concerned (a rather mixed way to put it but a good example of my ability at English).

That covers about all you wrote about. Hope Dr. Murphy gives me some similar notes on the sea birds. He can leave out the abuse about bad skins as that is taken for granted, but any tips re correcting mistakes or advice or hints re things to look out for, species of interest, spec. to concentrate on would all be welcome as I am still only a beginner along side your type of ornithologist.

Well I must close. Hope you will note an improvement in the second lot of skins as I like to think they are a lot better except for the tight rolling, but don't think I ever imagined they were good enough as even to my mind they were not and I knew I could do better, and have been consistantly bending all my efforts towards improvement and more improvement.

Best wishes for the season and trusting to hear from you soon.

I remain,

Yours faithfully,

L. Macmillan

Tanna, N. H.
2/2/37

Dear Dr. Mayr:

Yours to hand & skins have arrived OK. Really they are works of art & I doubt I will ever turn out such quality as they are. I will certainly do my best but I feel rather like the small boy with the pet bantam fowls who was disappointed with the size of their eggs, so got an emu's egg & a placard with "look on this & do your best" printed on it & hung them up in front of the nest boxes. I now know what the bantams felt like. Anyway you can rest assured I will do my best and those skins have certainly shown me a lot, but I wish I could have pulled them to pieces to learn a bit more about them. I have noted the following. I have not been filling my skins full enough especially in the breasts & have consequently had difficulty with the wings. From the same cause I have been drawing my scapular tract stitch too tight because I had so much loose skin & have been trying to make the wings go too much to the back. My necks have invariably been too thin & have left much too much loose skin in those parts. All over I have had too much loose skin & I believe that is the reason when I have put a skin to dry it has looked OK but later has gone wonky because of uneven tensions of skin, loose wrinkles etc. forming. Since correcting these errors I have noticed an improvement in my skins even though I do say so myself. But that every feather in place still tricks me. I can't get them to lay sometimes & pushing at their base doesn't seem to do the trick. It now takes me about 15 minutes to get a skin off & 45 to fill it & arrange it, but I really do think my quality is improving,

By the way, that white breasted hawk I sent you last year (in the first consignment of skins), what was it? I have another in slightly better condition, strange to say got about the same date & place. They are very shy & wary & hard to get although not by any means uncommon. Is it Torquota Urosp? Please give me fuller details of Accipeter Fuscata which you mention. I imagine it is smaller than this & I saw it once on Erromanga, more kite like in the wings? Am I correct?

We have just had 4 days of hurricane during which I got some interesting notes & did a lot of stomach examinations for food etc. in the days following the blow. Have taken a few more Puff. lherm. nugax, adults & 3 young chicks, one about a week or less old, one few quills just forming at 2-1/2 weeks, one wing & tail feathers all formed at about 4 weeks,all skins, as no doubt Murphy can get spirit dope from the previous ones I sent. Have failed to get a single Fregatta Albigularis, egg, chick or adult this year, in spite of 4 expeditions after them & I believe it is now too late for them.

Have some interesting dope for Dr. Murphy on P.lher. nutax, habits etc. & some interesting data re petrels in general, their mortality from natives, & principally their mortality from native dogs & wild dogs. You might ask Murphy to give me a brief summary of those sea bird I sent along & he can include a note of anything he particularly wants me to look out for.

Am off to Aneyturn within the next day or two, my next letter probably in 3 months time will give you the dope from there. Am going via Futuna & will put in a day or so there, must get their Turdus. Believe Gregory is there also, so may get Chalutes there. I once saw Chalcites (?) there myself. Must get their single parrot which I think is Charmosynopis.

Hope you have sent along funds as I am pretty low down to a pound or two & I will need more to do Aneyturn & finish Erromanga, as I have all the east coast & most of the hills to do there yet, but 6 weeks should finish Erromanga.

Well I must close, I remain,

Yours Sincerely,
L. Macmillan

P.S. Hope those Petroicas arrived OK by post, I registered them.

L.

Tanna, N. H.
5/2/37

Dear Dr. Mayr:

Am enclosing a letter from the New Caled. authorities which seems OK. I wrote them long ago & received no reply except to advise me that the matter would be considered on the arrival of the new Governor. I wrote the last mail making the following offer. I would be bound by the local game warden in the matter of numbers of birds of any rare varities taken & would consult him before commencing. Any new birds found I would supply 2 skins of to their local museum or to any French museum they suggested instead, but on condition that the skins first went to you & that any such French institute refrain from publishing anything on them till they received permission from you. To prove my bonafides & that I was collecting scientifically, their game warden could examine my field book at any time but he must not disclose anything he found therein. Their reply seems pretty favorable. If you decide to back me in this expedition I would be obliged if you would forward me a paper in French & English signed by your authorities on your official paper establishing my bona fides as a scientific collector & that I am not in any way engaged in it for commercial gain.

No funds to hand yet. As I am very short I may take a local job for a while but this will be during the off season for skins & as soon as funds arrive I will recommence on the bird work.

If you decide to back me in the Loyalties trip I would be obliged if you would make the following inquiries of Remington small arms or Winchester small arms on the enclosed address. Am enclosing a specimen cartridge (shot) all metal can. The price of these per thousand? Also whether they could manufacture a shot cartridge all metal case similar to their high velocity bullet 22 cal. The cartridge I have in mind is about this long [redacted] but of course loaded with shot. It would be wanted with sufficient powder to kill at 50-60 ft. (small birds) & the rest of the capacity shot No. 10 or smaller. The cost of one of their single shot 22 cal. rifles chambered to fire these cartridges. The cartridges I have in mind (bullets) are a good deal longer than the ordinary extra long or long rifle but it is some time since I have seen any & am not sure of the exact length which might possibly be as much as 1-1/2" Tell them paper

cartridges are useless they must be all metal case. The one I enclose is quite good & called their long shot cartridge & kills Zosteropes, Myiagra, etc. at 30 ft. but I want something a little stronger for kingfishers etc. I find these cartridges do not damage skins much & are very satisfactory as well as being so much cheaper. I only have a limited number about 100 rounds on hand but can get more easily in Australia. The paper ones are useless. These quotes would want to be with smokeless powder. If you decide to send me to the Loyalties I would send you particulars of the cartridges wanted. It would be best if you radio me that backing is arranged then on receipt of your wire I would write you particulars of cart. etc. wanted & you could forward them direct to Nomea & I would pick them up there when I arrived. Anyway fuller instructions could be sent along later when I replied to your radio. Naturally I would like all available data on birds from those parts, on Caledonia. I think the only chance of new stuff would be in the rain forests above 3000' that is principally why I stipulated the N.W. of New Caled. Of course it's the thin edge of the wedge & I could probably wangle it for all New Caled. if I thought it necessary at a later date, Anyway am awaiting your further communications on the matter. Personally I think if backing is given a radio should be sent advising me so I can immediately let you know my movements & thus save time re supplies. A small cheque would cover many things I planned to purchase in Australia to save time. Your end would supply cotton, labels, cartridges, monel metal wire (different gauges) arsenic, skinning tools, sewing cotton, guns, tent, camping kit; foodstuffs I could get the Australian end. Alcohol would not be a large amount so that I could get locally.

I have half a mind to forward some skins of my present quality to show how my standard is improving but they are barely dry yet so will forward some later. I am certainly endeavoring to turn out as good an article as possible & I honestly believe you will be satisfied with them as from this date onward & many before this date are passable, a few feathers are out of place I admit in some specimens but the majority pass muster I think.

Trusting to hear from you next mail as there was no word this mail.

I remain

Yours sincerely,
L. Macmillan

Erromanga

10/3/37

Dear Dr. Mayr,

As you can see by the address I didn't get to Aneytium as I had planned. A hurricane followed by a second on kept us weather bound for 3 1/2 weeks. Then I received an SOS to come up here and look after this place during the owner's absence for medical attention. Will complete Erromanga while I am here and take some more skins of better quality as no doubt the last Erromanga ones will not open up well as they were too tightly wrapped. My skinning now is slow and could be improved but it is certainly ahead of what it was. The fuller filling and lighter wrapping has made a vast improvement but wing and tail positions are not the best, also those odd feathers out of place givea lot of trouble and I have little success in rearranging them. If I can get a couple of skins dry in time I will forward them for criticism, I will send a good one and a bad one if possible, a sort of best and worst of what is on hand here on Erromanga. I have a case on Tanna which I left to go forward on this steamer if possible but it is more than likely it won't go, as I unpacked it when we knew of the shipping strike and left it to be repacked and forwarded by a friend if he has time. I honestly think 80-90% of my skins now will pass muster but I still get the odd ones which won't somehow come right.

I haven't had much chance so far to get out, but as most skins I have examined are pretty badly worn I am not worrying much. I find the large brown petrel nests here on Erromanga but am not sure about P. Nugase or F. albigularis. I hope this time to get across to Goat Island, a small island E of Erromanga and even if I don't take skins, I will make a record of birds seen.

I must close, will write you further next mail.

Yours faithfully,

L. Macmillan

Erromanga
New Hebrides

14/3/37

Dear Dr. Mayr,

By this mail I have two of yours dated 8/12/36 re Erromanga consignment and 4/2/37, both arrived together, to answer which I will do so in detail and will give you a rough forecast of my movements re the future as near as I can forecast them.

It is certainly most gratifying to have your congratulations re the improvement in the quality of my skins. But I honestly believe you will be even further gratified with my present results. By this mail I am forwarding a small package of skins, the best and the worst I have on hand. In spite of your praise I would be gratified if you will criticize them and point out any improvements you might suggest. Note in the 2 Zost. lat, how in the worst feathers are awry. These are not picked speciments but taken at random from the 20 odd skins I have with me. The ♀ Petroica is in a mid moult but I believe I could have done a better job, any tips would be welcome. I note what you say re degreasing and will pay attention to this in future. I trust these few in the tin will open up O.K. I want my skins to be perfect as I believe that if a job is worth doing it is worth doing well and not just good enough.

As you remark if I continue to bring back such complete collections there will not be anything left for other collectors. That is my aim. I am a slow but thorough worker, I keep cost down all I can and the easiest way to do this is to do the job thoroughly and only once. To my mind it would be a great shame and rank disloyalty to my backers to have someone come after me and find several new birds which their museum would have and yours would not except at great cost in sending a further expedition. Of course casuals and very, very rare birds one cannot help missing but of usual kinds there is no excuse for misses. Maybe I am too slow in my work but when I receive full support as you are giving me for the Loyalties I will no doubt cover the ground much faster. Also I will be in an entirely new area where my ability as an engineer, carpenter, boat builder, etc. are now known and important friends with refractory engines won't call along to get them fixed. Being well known in an areas has its disadvantages as well as its advantages. As most people consider my bird work of no real importance and their engines as

really important they are inclined to go sour if I say no. Anyway I won't know anyone in the Loyalties and won't know anything about engines when asked.

Your remark a short prelim. paper on Tanna is in press. There is a bit more Tanna stuff to go along, a fair ♀ Turdus, better Rhipidura and Myagra and Zost. lat and flav., a fair series of rails Hyp. philp. There is a black rail I am determined to get, it may be quite new, but I have been out of luck so far. I also want a small rail which is present (P. cininera I think) and have had only 1 flying shot at it so far but have done 4 trips into the south after it where it is. I got a young white tailed tropic bird which is already recorded from this group. I know the red is present but haven't got it. Anyway, this data can all be added later. Don't look on Tanna as completed. Also all my field notes have yet to go and may be valuable to you. A camera would have been useful to illustrate my types of country but I haven't one (I don't think one will be necessary on Loyalties as variation will not be so great) although I can operate one quite well and used to make quite a bit from my photos, when the depression came I gave it up as too expensive a hobby.

I have not heard from Harrison for months and he did not reply to my note re his copy of field notes or any enquiry whether he intended publishing as if he did not you might possibly do so.

Re yours of the 4/2/37. My letter has probably gone astray which is not unusual from here. As note I receive this mail 2 letters from you 8/12/36 and 4/2/37 nearly 3 months difference. Oh we have a lovely govt. service called Condominium known locally as Pandemonium.

You say the Whitney committee have approved the Loyalty expedition on your recommendation. Rest assured I won't let you down. By last mail I forwarded you a reply from the New Caled. authorities. As to when I can start I will put forward my proposals at the end of this letter and my plans as far as I can at present forecast them. As you say leaving out N.C. should make the cost fall well below $2,000 but like you I am a good deal in the dark re costs, etc. in that place and based my estimates on figures given me by local residents who have lived or are New Cal. born.

One thing which will be to our advantage will be the fall in the franc. When I made that estimate I was told that board and lodging would be from 30-45 francs per day which was then about $2.30 to $3.00 but now is $1.50 to $2.25. As you can well see this is going to prove much in our favour. Of course for food provisions it won't make much difference as most of the stuff will be Australian or foreign as N.C. imports so much of her stuff. Another thing I believe I will have to stay with chiefs mostly on the Loyalties in which case possibly 20-50 cents a day will be ample.

You ask about the shipments I have on hand as I explained in my last note the 100 odd skins I had on hand ready to send I held on account of the strike and for safety unpacked them and left them with a reliable friend to sun periodically and pack and ship by this trip of Burns Philps steamer, but he may not have time as he has a number of other things to attend to, in which case they will go forward next trip, but I will advise you by wire when they leave. As to my progress I will deal with this later as also with the Aneytium trip. Rest assured the Aneytium trip will be done as I am just as keen as you are to have the Southern New Heb. completed.

I note what you say re the 6 or 8 specimens of each endemic forms. I had in mind 4 spec. of each sex in most of the species and suggested this to the authorities in N.C. and agreed to be confined to their numbers in their rare protected bird but believe I can manage to get at least a pair of Nymphicus c. u. Your list arrived O.K. but I still have your last list of Loyalty species. I am enclosing a specimen page of a booklet the B.M. drew up for me. I would be obliged if you have a typist who could run me off a rough copy along similar lines and as there are only forty it should not take too long. A good deal of the reference data could be left out, unless it is of especial importance. This would prove of assistance to me as it can be turned up rapidly and is smal and concise. A rough binding of a couple of stitches would be advisable. If you have no typist handy or available it cannot be helped and I will have to scratch along but it would be much appreciated. Writing only on one side leaves me a blank page opposite to put my own notes on which is most useful. Also any remarks or directions from you re certain birds goes in and thus is a constant reminder. I note what you say re the smaller islands and will only work these in if funds and time are available without detriment to the main 3 islands.

As regards mammals I will certainly do my best and should be able to manage something but will not jeopardize the bird work. The same applies to insects.

Re means of reaching me with supplies, I think your plan of opening an acct. with the bank of New South Wales would be best as far as funds go. As for supplies of cartridges, cotton, etc. you will be sending me, I suggest you use the enclosed address (I am not sure of the address and am getting a friend to enclose it positively correct). C. Sullivan and Co. are the biggest agents shipping out of Sydney to New Caledonia. You could get a business reference about him from "The Bank of New South Wales," George St., Sydney. My main reason for suggesting him as a Sydney is as follows. Firstly, he is most satisfactory and does a large business with the New Heb. and New Caled., is well known and will probably give me useful introductions in the Loyalties and will have his own agent in New Caled. Also he can arrange any consignments to you as he deals in produce to all overseas companies and countries. Secondly, his commission for purchasing and doing business is 2 1/2% as against 15% by Burns Philp. This is a considerable saving. Thirdly, he buys on 2 1/2 for foodstuffs, etc. and could buy for me in Sydney. If you shipped cartridges, etc. to him, I would keep in touch with him and he could reforward to me wherever I was through his local New Caled. agent.

As regards current expenses. I think $200 at the end of the first 3 months would be best and by that date I could have a fair idea of expenses and know how I stood. I feel sure I would have an ample balance still in hand to tide me over till I could let you know the position.

Now as regards supplies from your end. Firstly, guns. a 20G and a 410G are O.K. But I think a great deal of expense can be saved by my previous suggestion re a small 22 cal. rifle. If it is too expensive to have the longer shot cartride made it would not be worthwhile having the chamber bored out the extra distance to carry them, in which case I would use the ordinary ones the packet of which I sent you. I find these good for all the smaller bird and even up to Pachycephala in bush where shots are reasonable close, 30 ft. or so, but they won't kill vigorous birds like Halcyon unless very close and any eye shot. The rifle I have in mind in their ordinary single shot 22 cal. made to shoot 22 short, long and long rifle bullets. The price in Aust. is about $6, so should not be more than $4 to you in the states.

They would rebore it for the extra long shot cartridges for a dollar I think. The price of these small cart. in Aust. is about 40 cents for 50, or less than a dollar a hundred. (All the skins going forward this mail are shot with the ordinary long shot 22 calb., the box of which I sent you.) Anyway phase include a cheap 22 cal. rifle and at least 1000 rounds of the ordinary long shot 22 cal. cart., but they must be all metal case as the paper cases are useless in this damp climate. I suggest the following from a close perusal of your list of birds and a rough estimate of birds I might expect to find.

1000 rounds 22 cal. "long shot" shot cartridges for 22 cal. rifle.
300 round 22 cal. "extra long specials" shot cartridges for 22 cal. rifle
(If these are not available never mind as I have estimated in ordinary 410G, no 10 shot. If available take 150 rounds off 410G cart. ordinary)
300 round 410G ordinary. 250 rounds no. 10 shot, 50 rounds No. 8 shot.
350 rounds 410G extra long. 300 rounds No. 10 shot. 50 rounds No. 8 shot
100 rounds 20G No. 6 shot.
150 rounds 20G No. 4 & 2 shot, principally for sea birds

1300 rounds 22 cal.
650 rounds 410G
250 rounds 20G
2200 rounds total

Further supplies I can let you know about when on the field and when I see how things are panning out. But remember any temporary shortages can be replaced in the field as New Caled. uses a good quality cart. unlike here. Please send cleaning gear and I will guarantee to return the guns in first class order. Oil, etc. I can get myself in Aust. Rods and brushes are what I want.

Skinning tools I have from this expedition and will take with me. Wire I can get in Aust. I think 20 lbs. of cotton will be amble to begin with as I am almost sure to have some left over from this exped. I will probably have some cartridges but can let you know later. The 12G and 16 won't be any good to me except to give to native shooters. If you decide to have them returned to you, let me know and I will forward them. One fact worth remembering is that I can use them for porters' wages and they have an appreciated value as they are accepted at local store prices and cost the exped. a good deal less than that as local dealers make a fair proft. Possibly to avoid difficulties

with authorities about poisons if you forward me a lb. or 2 lbs. of arsenic it would save trouble. Carbon tet. chlor. I can get in Aust. Also dry meal for dusting and plaster of paris, etc. I can get my end. Alcohol I can get locally if you send vials. But these I can also get locally in Aust. at reasonable prices. Do you consider my idea of camphor wood boscs for consignments is worth the expense? They cost me about $4 locally. Napthalene I can get locally. That about covers the ground I think as all small things, needles, cotton, etc. I can get locally. Also tent, utensils, etc. will be got locally. Tags. I enclose a specimen of what I would like, providing it was not too expensive to have it done. Printing to be the same size as that at the top. (AM of NY). Perhaps it would be cheaper to have a small metal stamp made for me, or rather 2 stamps. I could then just print these on to your standard label. Note the line of printing on back of tag. If you had them done for me, 1000 would be ample, but possibly that would be as expensive as 5000. If it comes to more than a dollar or so either for the metal stamps or for the printing, don't bother as although it takes me longer and the results are not so neat, it is not of vital importance. But I do get the "ga gas" signing my own name. I tried a rubber stamp but it was too large and smaller letters were too blurred.

As regards my present and future movements, this is what I plan. I will be here till the end of April, will then go to Tanna and a week later go to Futuna and Aneytium and expect to finish there by the end of July, but allow say till end of August in case of transport holdups. I will then go direct to Noumea, see the authorities and start in the Loyalties. Anyway unless some very unforeseen circumstance turns up, I think I can definitely say I will be in the Loyalties in early August. If transport can be fitted in, I may be there earlier. It will be a great relief to have your full backing there and be able to go ahead uninterruptedly at bird work. Working as close to the bone as I have has been wearing. The cash I will get for my six weeks keeping an eye on this place I intend putting towards the completion of the southern group. I will only get $25 but it will all help and as I will still be carrying on a limited amount of bird work and being kept for nothing it will all help things along. I will still need about £25 or $100 to finish Aneytium, possible $150, fares, boys' wages and food, etc. will cost about that much. I have been down here well over 12 months, in fact 18 months and have averaged about $50 a month's expenses and have not been able to put in full time on birds owing to outside circumstances, but have spent at least 3 quarters of my time on them. My field notes are pretty

extensive and when boiled down should be quite valuable. My maps are not to scale or perfect but should assist you to make your geographic survey of the group, this end anyway, very thorough. And I hope no further work in this part will ever be necessary for your institute. Anyway continue to send letters, etc. here as I will advise you of my movements and if necessary will wire you if and when I am leaving. I have given up all idea of going to Aust. for some time. If you have sent letters to me care of B.P. Syd., it doesn't matter as I have written them to forward them here.

I think that about covers all the ground. Trusting to hear from you soon and that my plans and suggestions are all right as far as you are concerned.

I remain, yours faithfully,

L. Macmillan

Encl. tag and C. Sullivan's address. Spec. of page of rough draft book.

P.S. Mary, thanks for your efforts re the bonus. I only hope I can repay you fully.

Erromanga

18/4/37.

Dear Dr. Mayr,

Firstly to let you know how things are going as far as further work goes. I have been concentrating on female Pachycephala as I only got 2 last year. Though Pachy. is about 10 times more common this year compared to last year due, I believe to the hurricane in December last hot season (I have some interesting notes on this you will see later when the field book goes forward) they are very scarce. ♂ outnumber ♀ about 10 to 1, but I have 4 so far, 2 are imm. and 2 adult. I hope to get at least 2 more to give you a good series with the 3 that went forward from last year's work. These are of better quality as skins I think. N.B. Your work in AMNH No. 531 28/5/32 as regards Pachy. for Erro. is quite correct I think, in spite of your having no Erro. ♀ to go by. I have at last got 5 Erythrura, 2 ♂ ad., 1 ♀ ad., 2 juv. They also are much more common this year. I have been pretty heavy on Collocalia (and consequently cartrides) and I am nowhere nearer the solution of them. Last year I knew there were the 3 spec. here and thought there were possibly 4. At present I think there are 3 with a great range of variation. At one time I thought there were 2 Coll. escul, 1 with white in tail, one without. 3 Coll. spod. leucox., 1 white belly and rump, smallishes W. 108, one without white belly but white rump, W 108. One without white belly but white rump and W. 117. 2 Collocalia vanihorinsis, 1 large, 1 smaller. At present I think there are only the 3 with variations, especially in C. spod. leucop., the silver grey of whose belly in different moults could be mistaken for a white, as I notice a big range of measurements in C. van. I think the same applies to C. spod. leucop. I have 5 C. spod. leucop at date.

Here are all the measurements, note the range. All have central feather stripes in white feathers and a central stripe in the silver grey feathers of the breast and belly.

Sk. 456 27/3/37 ♂ 1/2/W 117/Tl. 51/skull not examined.
Sk. 459 29/ - ♂ 1/2/W 109/Tl. 48/about 1/3 ossified.
Sk. 473 8/4/37 ♂ 1/4/W 109/Tl. 49/ about 1/2 ossified.
Sk. 473 -- ♀ 1/2/W 116/Tl. 48/about 3/4 ossified.
Sk. 476 9/4/37 U.S./W 117/Tl. 48/ about 1/8 ossified (only just starting above the eyes and up the central join).

They certainly have me thinking as I don't want to disturb them in the dryer just yet a while I cannot quite decide what they mean, but I think they are all one sub species. Erromanga is an A1 Collocalia place as most of the S and W of the island coast is high 600 ft. coralline uplift

slopes and cliffs abounding in caves and the open type of scrub and grass uplands form an ideal hawking ground. They don't hawk much in absolute grassland, principally I imagine because of lack of cover and absence of their insect food. So far I have taken a few more C. vanihior. and C. esculenta. but need a couple more esculenta. C. vanihoro range over a big wing variation also, almost giving one the impression of 2 kinds, a large and a small but I think they are one race.

Last year you asked about Turnise, the button quail, or any other grassland bird being present. In my notes I deal with the reasons I believe why there are none, principally fire in the grasslands, today by the pastoralist, previously by natives as defense. I saw one bird once I couldn't place which might have been Turnise but I doubt it. Anyway that is in my notes.

I have one more Clytorhyuchus but unfortunately it is a ♂. I have been waiting since I came to get out after an unknown bird in the southern mts. which the natives describe. I place it as Guandcanaria but it may be Aplonis. They themselves hardly know it, as the population here is very small (400) and the island large, they only keep to tracks, etc. and this bird inhabits the hills well above the places the natives go (unless they are after sandelwood which doesn't grow on those particular hills) where it lives on certain flowering trees according to the few natives who do know it. I have been here 7 weeks and we have had 51 inches of rain and a hurricane in that time and most rivers have been unfordable, so you can understand I have been pretty much kept at home and in any case I could only get to a distance at weekends as I have to keep an eye on the place here. I have taken about 40 skins though, but they are mostly repeats of last year but better quality I think.

As it takes so long to arrange things between us, I am this time writing you what at present are my ideas of what I will make my routine in the Loyalties. I want to have any suggestions you can give me and also definite ways of measuring, etc. and give you here an idea of what I intend doing and my prsent idea of doing it.

I will keep 2 field books, one always be me and one a loose leaf book which will go forward in loose leaves to you

with each consignment. I am getting these loose leaves from Australia. If by any chance either those going forward or my book is lost there will then always be a duplicate available.

Erromanga

20/4/37

Dear Mayr,

On looking over your last 2 letters I note a thing which I don't think I have answered. You remark I found several birds on Erromanga which appear to be absent from Tanna, namely, Lichmera, Pachycephala, Clytorhynchus, Coracina. I can definitely say these birds are all entirely absent from Tanna, as far as a line from north of Linahil to N of Weisisi from my own observation and I have closely questioned boys from north of that line (about 1/5 of the island and of that 1/4 is cane grass, etc.) who are working here at present and they know the bird I mean and they do not know of them. Also I think Collocalia spod. leucop. is entirely absent and Collocalia van. is rare south of that line (I have a few skins) but appears in the north of the island. Tanna seems an island of absentees, as Aplonis is absent, Guandelcanoria, Neolalage. These as far as I at present know are absent on Erromanga also, but I have an idea Guandelcanoria and Neolalage may be found in the different type of bush on the east coast or in the southern tableland with forest. Certainly one bird I haven't got is found there. I think it is definite Cyclornis is absent. One thing I am surprised at is the absence of Gerygone in both islands so far. By what a Futunese native told me it may be present there.

In doing Collocalia skins the length of their wings bothers me a great deal. At present I am arranging them in the following manner. Is it O.K.?

The angle is less than shown and actually wings come well beyond the tail more like the pencil wing.

It leaves a nasty up jut to be damaged in packing but by putting a wad of cotton on the back of the bird and rolling in a big cylinder of paper, the wings are not pressed out of shape. The wings come rather far up the breast sides but don't hide the rump feathers so much. The only other alternative I can see is to do flat skins as Harrison did, i.e. but these take up such a lot of room and have to be packed flat between paper. They certainly show all parts of the bird well. Collocalia is an awkward shaped bird. By the way, while on this would you ask the mammal department about the wing arrangement of the fruit bats, are the wings flatter than in a bird or are somewhat around the body in the same way as birds. Their booklet doesn't quite make this clear. By the way if cartridges

haven't gone forward, I will need 100 rounds of 20G, No. 10 or 12 for Collocalia in the Loyalties as Mare is sure to have coral cliffs and caves where they rest. You list only 2. I will be surprised if there are not 3.

Last mail I wrote re needing about $150 to complete the south. If you are agreeable I could use that amount from the funds you will have sent to Sydney and I don't think it would restrict me or inconvenience me in anyway as regards the Loyalties. I intend adding the few dollars I get here to the fund so it will probably come to quite a bit less. Also to save a steamer fare a local has offered me a free passage if I fix his launch for him, I think I wrote you that before. I think I can fix it in about a week and it will possible save me having to be marooned on Aneytium the full 12 weeks and so enable me to get to the Loyalties sooner. I can assure you I am always as economical as possible, I'm Scotch, and would have had the expenses of the south reduced a great deal had I not had to build myself a grass house and quarters after father left the group. As a jim-crack affair meant too much risk to specimens I had to build it pretty solid which was just as well as it has had to weather a number of hurricanes. When away from it I have to pay a boy to look after it and see nothing is stolen. I pay him $4 a month and when I am there I have him cook for me, etc. and pay him an extra $2. To have the house built it cost me $60, food for labour and everything. My own food bills and all expenses don't reach $40 a month so I don't think I am extravagant. Owing to my cook's limits in the culinary art, the amount of boiled rice I consume should enable me to speak Chinese subconsciously and if ever I go to China, I should be at home within a few hours.

28/4/37

Mail has arrived but I have nothing of yours to answer but have to acknowledge receipt of official document from your authorities re may bona fides as your representative in the Loyalties. Also have to acknowledge receipt of your paper on the homing instinct in birds for which I thank you very much as it is a subject which greatly interests me and which I have experimented with a little in my own way but not as accurately. Have you done any work in birds and their young by removal to outside areas, in bird which have regular territories? I use

birds such as Petroica and their young, which are barely capable of flying and therefore possible to catch but big enough not to suffer from the experiment. My findings are not systematic or regular or accurate enough to make an article on, but have proved very interesting to myself. I thank you most sincerely for your goodness in sending along the paper.

Since finishing the previous part of this letter, I have got Eudynamis here on Erromanga, also 3 more ♀ Pachy. so will have a fair series of them for you as I note no other museum has them you may be able to arrange an exchange with the B.M., but this I doubt as once it is proved the same as Efate they will be satisfied with their Efate females. Have 2 more Clytornchyus but both ♂, no female yet.

By this steamer a number of (uncounted) skins are going forward, (Tanna and Erromanga Islands) in the usual camphor wood trunk. Burns Philp will notify you as usual of date of arrival and charges due which you can fix up through the usual channel at your end. Marks will be on end AMNH
N Y
USA
SPECIAL CARGO

top Dr. Mayr
Amer. Mus. Nat. Hist.
New York
USA

Hope they open up in good order. You will note a gradual improvment in them up to the recent dated ones. Some of the Tarma Turdus are very poor but hope to get you a good pair for type skins before I leave the south. A number are repeats of Zosterops, etc. from which you might get a good type for the new Zosterops.

Have had no word from you re the Loyalty funds and whether you have opened an acct. with the Bank of NSW as you suggested and hope you have had my previous letter on this. Re my movements it at present looks as if it will be wll on in July before I can finish here as the chap whose place I promised to look after for six weeks has let me down and has not returned. Anyway in six weeks or less I am going to Aneytium whether he returns or not and have informed him of my intention.

Well I must close, trusting to hear from you next mail, I remain

Yours sincerely,

L. Macmillan

Tanna
New Hebrides
9/6/37

Dear Dr. Mayr,

Am on the way to Aneytium and may not get a chance to write again till on my way to the Loyalties.

Skins of all I have on hand which are dry have gone forward along the usual channels. They will complete Erromanga but a few strays of Tanna may come later with Aneytium material. On looking over notes I see I neglected to collect an adult Columba vit. leop. but this bird is common and the same as Tanna. I also failed to get a single Tyto in spite of much effort on my own part and numerous boys scattered over the greater part of the island. It is fairly common and I often heard it this year but couldn't get a shot at it. One was killed the week before I arrived and on examining the badly decomposed bird, I have an idea it was fairly buffy underneath. Present on Erromanga but not very common, I failed to collect one but identified it beyond question a dead bird last year (too decomposed for skinning) is Hypotainidia, it appears identical with Tanna. A rail which is rare I saw twice and think it is Poryona cln. tannensis or closely allied as the eye stripe was prominent and noticeable. Charmosynopiis palmar is present but very rare (or a close relative) and comes about flowering ivory nut palms and odd flowering trees at 200 ft. and over. It is absent or inconspicious mostly and rarely appears. I saw one sea eagle but failed to get him. Saw several Falco but they were not very common. Saw one whitish unidentified hawk which appeared smallish but it might possible have been white phase of Circus.

I found that all 4 species of petrels nest on Erromanga but didn't get their skins. Traitors Head in the NE is a fairly large colony of all 4 kinds. Many sea birds nest on the small Goat Island just off the NE point. Frigata ariel having nested there several times according to native observation. I failed to reach the island. To the best of my knowledge I obtained every other bird which the island has. Chalcities luc. lay. seems to be entirely unknown and absent. Aplonis is absent and so is Guanchlcanaria the bird the boys spoke of from the southern mts. was undoubtedly Charmosynopus. I went to the top of all the principal hills and camped near 3000 feet and failed to find anything different to lower levels and any variation

in species at both levels was irregular and insignificant except possible in the case of Pachycephala and possibly Lichmera but have enclosed skins from this area of each bird and you can judge for yourself. Pachy. seems to have brighter colours and a tendency to reddish or orange tinges but I took a series of 6 on the same day from less than 1000 ft. and 3000 ft. or a little less and could not distinguish them as each ran into and exceeded the other (thus 1-6 from under 1000 ft. had tone values, 1 to 3 as follows, 2 of 1, 2 of 2, 2 of 3, Nos. 7-12 had tone values, 1 of 1, 2 of 2, 3 of 3) but generally speaking ad. males and ♀ are brighter at altitude, ♀ especially prone to a buff or orange wash (best. spec. is skin forward). Juv. ♂ same as lower levels.

I think that about covers all the birds and notes you will need to complete Erromanga. Anus sup. pel. is present but only common on Cook River. I didn't get a skin. Even on Cook River it was absent when I searched. All the waders present on Tanna are present on Erromanga. Butorides appears occasionally by native accounts and I saw one at Cook River. Turdus comes almost to sea level on the E coast but not the west. L lythornchyus come right to sea level on the E coast but not the west. My maps will explain this in detail later on.

I think that is about all you need to make a paper on Erromanga birds, the maps, etc. you can use later in your survey. I intend scrapping my system and adopting your suggestions for the Loyalties re each separate species and will survey all notes, etc. and forward it with maps and descriptions of areas and islands.

Well, I must close but may get a chance to write later by a visiting man of war. I remain

Yours sincerely

L. Macmillan

P.S. Vila advised me of a holdup in shipment of skins by oversight on their part but skins will go forward from Vila within 1 week this date so expect them 6-11 weeks later. They will advise you date of arrival as previously. In haste.

L.M.

(This material copied from notebook relating to insects, reptiles, etc. from New Hebrides is probably duplicated in these more extensive grographical notes.)

TANNA ISLAND, NEW HEBRIDES

VIAL V - Tag 15-11/28/36 Insects vomited by COLLOCALIA VANIKORENSIS when shot, while feeding on wing at sunset.

TANNA ISLAND (from Notebook #1)

TANNA ISLAND -- White Sands area is all an area of volcanic ash and sand, scoria, etc. tuff cliff along sea margins overlaying volcanic basalt lava, black and red at a depth of from 100 ft. in valleys to 200 ft. & more. No clay in area except atfresh water lake 2-1/2 miles - 3 miles inland at the foot of the active parisitic! volcano 1000' high. The vegetation except on the ash plain close to the volcano is luxuriant, this only being possible because of the good rainfall of 120" per annum as the area lies in the weather side of the island at the foot of 1000' hills which cause a good precipitation. The vegetation is in 3 distinct bands 1 - Native garden lands near the coast composed of garden areas in use, ones a year old with some scrub, grass, etc. in them and others 3,4,5 years old of various sized scrub, small trees, and shrubs with larger fruit trees, etc. along edges of gardens and roads. Fruit trees are breadfruit, many figs, few banyans, nut trees, fiji plum, mango tree, rose apple, coconuts, pandamus, oranges, mandarines, limes and lemons, horse chestnuts (wild pacific), Garden crops are yam, manioc, sugar cane, native cabbage (spinach), sweet potatoes, a little Fiji taru, and corn. The scrub trees are of many kinds with a good deal of brown or bastard cotton. 2d area inland - is made up of large trees, many lanyans, etc. with many fruit trees, and coconuts as in garden land areas, a lot of secondary height trees and a thin underbrush of scrub, ferns, etc. Natives run their pigs in this area which also assists to keep underbrush down.
3d area - inland is composed of fewer and lower trees with much canes, grass, pandamus, and tree ferns, these three finally predominating on the edges of the ash plain at the food of the volcano. (see rough map opposite page.)

Copy of MacMillan's map from Note Book #1
"White Sand Area" (Tanna Is., New Hebrides)
"not to scale and approximate only"